



Illinois Environmental Protection Agency

P. O. Box 19276, Springfield, IL 62794-9276

USEPA  
B.I.2

Refer to: 1838040027 -- Vermilion County  
Danville/Allied - Signal, Inc. -- Well #1  
ILD005463344  
UIC-003-W1-AC  
UIC Administrative Record

October 30, 1991

US EPA RECORDS CENTER REGION 5



1002074

Allied Corporation  
Attn: Don Phillips, Plant Manager  
Post Office Box 13  
Danville, Illinois 61834-0013

Dear Mr. Phillips:

Enclosed is an unsigned draft of the proposed renewal permit for your underground injection control well which we agreed to provide in the September 17, 1991 meeting. Note that no draft permit is being issued at this time. The official draft decision will be prepared in about 45 days pursuant to the existing in-house application unless your finalized renewal request is received before that time.

If you have any questions concerning this matter, please contact Ron Steward at 217/782-6762.

Very truly yours,

Lawrence W. Eastep, P.E., Manager  
Permit Section  
Division of Land Pollution Control

<sup>3</sup>  
LWE:RRS:lat/3293q,15

RRS

Enclosure

cc: Division File  
Central Region  
USEPA -- George Hudak, 5WD-TUB9  
ISGS -- Ed Smith

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C/D

## TABLE OF CONTENTS

Page No.**I. PERMIT CONDITIONS**

<b>A. WELL SPECIFICATIONS</b>	
1. Well Location .....	
2. Application and Plans .....	
3. Casing and Cementing .....	
4. Tubing Specifications .....	
5. Access During Logging and Testing .....	
<b>B. OPERATING, MONITORING, AND REPORTING REQUIREMENTS</b>	
1. Operating Requirements .....	
2. Monitoring Requirements .....	
3. Waste Analysis Plan .....	
4. Groundwater Monitoring Plan .....	
5. Ambient Monitoring .....	
6. Monthly Reporting Requirements .....	
7. Operator Certification .....	
<b>C. EFFECT OF PERMIT .....</b>	
<b>D. PERMIT ACTIONS .....</b>	
<b>E. SEVERABILITY .....</b>	
<b>F. CONFIDENTIALITY .....</b>	
<b>G. PENALTIES FOR VIOLATION OF PERMIT .....</b>	
<b>H. DUTIES AND REQUIREMENTS</b>	
1. Duty to Comply .....	
2. Duty to Reapply .....	
3. Modifications .....	
4. Need to Halt or Reduce Activity .....	
5. Duty to Mitigate .....	
6. Proper Operation and Maintenance .....	
7. Property Rights .....	
8. Duty to Provide Information .....	
9. Inspection and Entry .....	
10. Monitoring .....	
11. Records .....	
12. Signatory Requirements .....	
13. Reporting Requirements .....	
14. Corrective Action Requirements .....	
15. Twenty-four Hour Reporting .....	

16.	Transfer of Permit .....
17.	Financial Responsibility .....
18.	Cost Estimate for Plugging and Abandonment .....
19.	Closure .....
20.	Post Closure Care.....
21.	Financial Responsibility for Post Closure Care.....
22.	Incapacity .....
23.	Revocation of Permits .....
24.	State Mining Board Permits .....
25.	False or Omitted Information .....
26.	Restriction on Unpermitted Waste .....
27.	Plugging and Abandonment .....
28.	Conversion or Abandonment .....
29.	Inactive Wells .....
30.	Mechanical Integrity .....
31.	Contingency Plan .....
32.	Neutralization .....
33.	Continued Releases at Permitted Facilities .....
34.	Restrictions Upon the Future Use of Hazardous Facilities .....

## II. ATTACHMENTS

A.	PROCEDURE FOR PLUGGING AND ABANDONMENT OF WASTE DISPOSAL WELL (WDW) # 1.....
B.	PROCEDURE USED FOR MECHANICAL INTEGRITY .....
C	WELL DIAGRAM .....
D	PARAMETERS FOR WASTE MONITORING PROGRAM .....
E	PROCEDURE FOR CALCULATING AVERAGE VALUES .....
F	PROCEDURE FOR WELL FAILURE OR EQUIPMENT FAILURE .....
G	GROUNDWATER MONITORING WAIVER.....
H	SUMMARY OF SUBMITTAL DATES .....
I	CLOSURE PLAN .....
J	POST CLOSURE CARE PLAN .....

I. PERMIT CONDITIONSA. WELL SPECIFICATIONS

1. Well Location. Waste disposal well (WDW) 1 is located at 446.19 feet north and 46.88 feet west of the SE corner of the SW quarter of the NW quarter of Section 12, Township 19 North, Range 11 West of the 2nd Principal Meridian, Vermilion County, Illinois. The completed depth of the well is at 4025 feet or 3377 feet below Mean Sea Level.
2. Injection and Confining Zones. This Permit is for injection into Eminence, Potosi and Upper Franconia Formations only. The immediate confining zone is the Prairie du Chien Formation.
3. Application and Plans. Well operation shall be conducted in accordance with the approved permit application and plans prepared by Allied-Signal, Inc. and Dr. Alberto Nieto consisting of:

<u>Pages</u>	<u>Dated</u>	<u>Date Received</u>
507	November 1990	November 5, 1990
12	January 23, 1991	January 28, 1991
34	February 11, 1991	February 14, 1991
3	February 15, 1991	February 15, 1991

4. Casing and Cementing. The injection well, WDW #1, was cased and cemented to prevent the movement of fluids into or between underground sources of drinking water. The casing and cement used in the construction of the well are shown in Attachment C. (35 I.A.C. 730.165)
  - a. Surface Casing. The 13 3/8 inch surface casing is set and cemented to a subsurface depth of 224 feet. Cementing was accomplished with 10.92 cubic yards of class A cement with 3% calcium chloride added.
  - b. Intermediate Casing. The bottom of the 9 5/8 in. and 7 in. intermediate casing strings are set at 2773 feet and 3600 feet, respectively. They are cemented with Pozmix resin cement with 18% salt and 4% gel additives and the pump and plug method was used. The casing set at 2773 feet is cemented to the surface and the casing set at 3600 feet is cemented up to a depth of 1870 feet, the remainder being filled with kerosene to the surface as indicated in Attachment C.
  - c. Longstring Casing. The long string casing consists of 5 1/2 inch steel casing except the lowest 60 feet which is 4 1/2 inch fiberglass and is set at the top of the disposal zone, at approximately 3613 feet. It was cemented to the surface with 9.9 cubic yards of Epseal cement using the pump and plug method.

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5. Injection will only be through the 2 7/8 inch OD (outer diameter) fiberblast tubing between 0 and approximately 3545 feet and through 2 3/8 inch fiberblast tubing between approximately 3545 and 3672 feet. Tubing specifications are contained in Attachment C of this permit.
6. Conductivity Rings. Except as noted below, two sets of conductivity rings shall be maintained on the injection tubing at all times. Sets of conductivity rings shall be set at approximately 3575 feet and the upper set at approximately 3560 feet. A minimum of two wires shall be attached to each conductivity ring so that the permittee can monitor the continuity of the electrode system. If either set of rings fails, the failing set shall be repaired during the next scheduled mechanical integrity test; provided, however, that the well shall not be operated unless one set of rings is in operation.
7. Access During Logging and Testing. The Agency and Illinois State Water and Geological Surveys will be given access to witness the running of any logs or tests. (35 I.A.C. 702.149)
8. Blowout Preventer. A permanent blowout preventer shall be maintained on the wellhead at all times.

#### B. OPERATING, MONITORING AND REPORTING REQUIREMENTS

##### 1. Operating Requirements (35 I.A.C. 730.167)

- a. Maximum injection pressure. The maximum injection pressure at the wellhead shall not exceed 100 psig.
- b. Maximum injection rate. The maximum injection rate shall not exceed 125 gpm.
- c. Waste Parameters. The injected waste shall not exceed the maximum limit of the representative parameters indicated below. 35 IAC 730.168

<u>Parameters</u>	<u>Haz Waste Code</u>	<u>Range or Maximum Limit</u>
Total Organic Carbon (TOC)		200 mg/l
Arsenic	D004	500 mg/l
pH		5-10*
Specific Gravity		1.2

\*Excursions\*\* from the pH range of 5-10 are permitted subject to the following limitations:

1. the total time during which the pH values are outside the required range of pH values shall not exceed 7 hours and 26 minutes in any calendar month and
2. no individual excursion from the range of pH values shall exceed 60 minutes.

\*\*For purposes of this permit, an excursion is an unintentional and temporary incident in which the pH value of injected waste water exceeds the range set forward in the permit.

- d. Annulus Protection. The following procedures will be used to limit the potential for any unpermitted fluid movement into or out of the annulus:
- i. The annulus between the tubing and the long string of casing shall be filled with approximately 2,260 gallons of kerosene.
  - ii. A minimum pressure of 200 psig will be maintained on the annulus between the injection tubing and long string of casing during injection operations.
  - iii. Kerosene shall be maintained in the longstring casing annulus to a depth of at least 3560 feet at all times during waste injection.
  - iv. The Planning & Reporting Section, Division of Land Pollution Control, will be notified in the next monthly report submitted after an alternative or additive to the annular fluid is selected.
  - v. A pressure of  $65 \pm 15$  psig will be maintained on the outer annulus during injection operations.
- e. Annulus injection prohibition. Injection between the outer most casing protecting underground sources of drinking water and the well bore is prohibited.
- f. Prohibition of excessive pressure. The Permittee shall not use excessive injection pressure or volumes and cause:
- i. new fractures or propagation of existing fractures in the injection zone,
  - ii. initiation of fractures in the confining zone,
  - iii. migration of injected fluids into any underground source of drinking water,
  - iv. displacement of formation fluid into any underground source of drinking water, or
  - v. non-compliance with 35 I.A.C. 730 operating requirements.
- g. Filtration. All waste that is injected into the well shall be filtered through a 100 micron filter.

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- h. The owner or operator shall maintain mechanical integrity of the injection well at all times.
  - i. The owner or operator shall notify the Agency and obtain a permit modification prior to conducting any well workover.
  - j. An alarm system or system of alarms shall be maintained and operated at all times during waste injection activities. The system shall sound an alarm if:
    - i. 90% of the maximum permitted injection pressure is exceeded.
    - ii. The Maximum permitted flow rate is exceeded.
    - iii. The Casing-tubing annulus pressure falls below the minimum permitted.
    - iv. The conductivity rings on the injection tubing indicate the lowermost limit of the longstring annular kerosene has risen above the rings.
    - v. There is a continuity break in the conductivity ring system.
  - k. A trained operator shall be on duty and capable of responding to the alarm system at all times during waste injection. (730.167(f)(2))
2. Monitoring Requirements (35 I.A.C. 730.168)
- a. Sampling. The injection fluid will be obtained at the wellhead and shall be analyzed at the frequency specified in Attachment D. The pH and temperature will be measured at the time the sample for specific gravity is taken and used when the sample is analyzed for specific gravity.
  - b. Continuous recording devices. The following continuous recording devices or their equivalents shall be used to monitor the injection pressure, flow rate, pH, temperature, and annulus pressure:
    - i. Injection pressure gauges - Injection line/psi transmitter, Ashcroft Duratran, 2279, -30 in/hg-150 psi, Deepwell (bldg/psi recorder, Kent, P105M/13/000, -30 in/hr-150 psi.
    - ii. Casing-tubing annulus pressure gauges - Inner annulus/psi transmitter, Ashcroft Duratran, 2279, 0-400 psi, Deepwell bldg/psi recorder, Kent, P10M/13/100, 0-400 psi, Outer annulus/psi transmitter, Ashcroft Duratran, 2279, 0-160 psi, Deepwell bldg/psi recorder, Kent, P10M/13/000, 0-160 psi.

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- iii. Flow meters - Deepwell bldg/flow transmitter, Foxboro, E69P-IA, 0-150 gpm, Deepwell bldg/flow recorder, Foxboro, 40PR-RFE3F-K, 0-150 gpm, Deepwell bldg/flow total count, Foxboro, A2005KA-0-99,999,999 gal.
- iv. pH recording device - Injection Line/ph transmitter, Foxboro, 870PH-70-P-A, 0-14 pH, Deepwell bldg/pH recorder, Foxboro, 40PR-RFE3F-K, 0-14 pH.
- v. Temperature - Injection line/temp transmitter, Pyromation, 126-222-6260, 0-150°F, Deepwell bldg/temp recorder, Foxboro, 40PR-RFE3F-K, 0-150°F.
- vi. Annulus conductivity and cable continuity - Easterline Angus MRL Multipoint Recorder/Logger.
- c. Recording device ranges. All recording devices, except pH recorders, will exceed maximum permitted operating parameters by 20%.
- 3. Waste Analysis Plan. (35 I.A.C. 730.168a) The Permittee shall follow the written Waste Analysis Plan described in Attachment D of this permit.
- 4. Groundwater Monitoring Plan (35 I.A.C. 730.168(e)) The Groundwater Monitoring Plan Waiver is incorporated into this permit as Attachment G.
- 5. Ambient Monitoring (35 I.A.C. 730.168(e)) A pressure buildup and fall-off test shall be conducted annually using the procedure given in Attachment B.
- 6. Monthly Reporting Requirements
  - a. Report submittal date. Monthly monitoring reports are due by the 15th day of the month immediately following a reporting period. A reporting period is defined as a calendar month.
  - b. Contents of monthly reports. The monthly reports shall include:
    - i. Daily value for total volume and daily maximum, minimum, and average values for annulus pressure, injection pressure, and flow rate. The procedure in Attachment E will be used to calculate averages.
    - ii. The number of times the well is started up during each day



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- iii. Total hours of injection each day
- iv. Total gallons injected to date
- v. Monthly summary of:
  - (a) maximum, minimum, and average values for annulus pressure, injection pressure, and flow rate. The procedure in Attachment E will be used to calculate averages.
  - (b) total volume
  - (c) total number of well startups
- vi. Operating charts for the month submitted on 7 day circular charts for:
  - (a) annulus pressure
  - (b) injection pressure
  - (c) flow rate
- vii. A copy of the annulus conductivity and cable continuity recording charts.
- c. Other information in monthly reports. It shall be noted in each monthly report if any of the following tests or events occurred during the subject reporting period. A comprehensive report describing the test, event or item shall be submitted on a quarterly basis with the monthly report for the last month in the quarter (i.e., March, June, September and December). For example, an event which occurred in April should be noted in the April report and a complete summary should be submitted with the June monthly report which is due July 15th. However, events which occur too late in the quarter to allow inclusion with the last monthly report for the quarter will be submitted a maximum of 30 days after the date of the event or completion of the testing (35 I.A.C. 730.169(b)).
  - i. Periodic tests of mechanical integrity.
  - ii. Copies of any logs run on the well submitted with a log analysis.
  - iii. Any other test of the injection well conducted by the Permittee, including an explanation of the procedures used and an analysis and conclusion of the test results.
  - iv. Any well work over.

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- v. Maintenance performed on monitoring devices or well components.
  - vi. Changes of gauges, pipes, and other well components and monitoring devices.
  - vii. Changes in the type of annulus fluid.
  - viii. Addition or removal of annulus fluid.
  - ix. Summary of the annular fluid level fluctuations.
  - x. Graph of the pressure fall-off curve.
  - xi. The description of any event that exceeds operating parameters for annulus pressure, or triggers an alarm or shutdown device pursuant to Section 730.167(f) and the response.
- d. Illegible reports will be returned to the Permittee and deemed not filed. All graphs and charts will be labeled appropriately.
- e. Report submittal addresses. The cover letter for the monthly report will indicate a copy of the report was submitted to each of the following addresses:
- i. Illinois Environmental Protection Agency  
Division of Land Pollution Control - #24  
Planning & Reporting Section  
2200 Churchill Road  
P.O. Box 19276  
Springfield, Illinois 62794-9276
  - ii. Illinois Environmental Protection Agency  
Division of Land Pollution Control  
Field Operations Section
  - iii. Illinois State Geological Survey  
Groundwater Section (Deep Well Disposal)  
Attention: Mr. Ed Smith  
Natural Resources Building  
615 East Peabody Drive  
Champaign, Illinois 61820
7. OPERATOR CERTIFICATION. Annually the owner or operator shall provide a certification statement asserting that there will be a trained operator on duty at all times during injection activities. (730.167(f)(2))

- C. EFFECT OF PERMIT. The existence of a UIC permit shall not constitute a defense to a violation of the Environmental Protection Act or Subtitle G except for development, modification or operation without a permit (35 I.A.C. 702.181). A permit may be modified or revoked during its term for cause set forth in 35 I.A.C. 702.183 through 702.187.

The Permittee is allowed to engage in underground injection in accordance with the conditions of this permit. The underground injection activity, authorized by this permit shall not allow the movement of fluid containing any contaminant into underground sources of drinking water, if the presence of that contaminant may cause a violation of any primary drinking water regulation under 40 CFR Part 142 or may otherwise adversely affect the health of persons or the environment. Any underground injection activity not authorized in this permit or otherwise authorized by permit is prohibited. (35 I.A.C. 704.121 and 704.122)

Compliance with the terms of this permit does not constitute a defense to any action brought under Section 1431 of the Safe Drinking Water Act (SDWA) or any other law governing protection of public health or the environment for any imminent and substantial endangerment to human health, or the environment. In the case of disagreement between the conditions of this permit and the application, the permit conditions shall govern.

- D. PERMIT ACTIONS. The filing of a request by the Permittee for a permit modification or revocation, or a notification of planned changes or anticipated noncompliance, does not stay the applicability or enforceability of any permit condition. (35 I.A.C. 702.146)
- E. SEVERABILITY. The provisions of this permit are severable, and if any provision of this permit, or the application of any provision of this permit is held invalid, the application of such provision to other circumstances, and to the remaining provisions of this permit shall not be affected thereby. (35 I.A.C. 700.107)
- F. CONFIDENTIALITY. In accordance with Section 7 of the Environmental Protection Act, certain information submitted to the Agency pursuant to this permit may be claimed as confidential by the submitter. Any such claim must be asserted at the time of submission by stamping the words "confidential business information" on each page containing such information. If no claim is made at the time of submission, Agency may make the information available to the public without further notice. If a claim is asserted, the validity of the claim will be assessed in accordance with Illinois Pollution Control Board and Illinois Environmental Protection Agency procedures. Claims of confidentiality for the following information will be denied:
1. The name and address of the Permittee;
  2. Information which deals with the existence, absence or level of contaminants in drinking water.

G. PENALTIES FOR VIOLATIONS OF PERMIT CONDITIONS. Any person who violates a permit requirement is subject to civil penalties, fines, and other enforcement action under SDWA and the Environmental Protection Act.

H. DUTIES AND REQUIREMENTS

1. Duty to Comply. The Permittee shall comply with all applicable Underground Injection Control (UIC) program regulations and conditions of this permit, except to the extent and for the duration such noncompliance is authorized by a temporary emergency permit under 35 I.A.C. 704.163. Any permit noncompliance constitutes a violation of the Illinois Environmental Protection Act and is grounds for enforcement action, permit revocation, modification, or denial of a permit renewal application. Such noncompliance may also be grounds for enforcement action under the Resource Conservation and Recovery Act (RCRA). (35 I.A.C. 702.141 and 35 I.A.C. 704.181(a)).
2. Duty to Reapply. If the Permittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the Permittee will submit an application for a new permit at least 180 days before this permit expires. (35 I.A.C. 702.142)
3. Modifications. (35 I.A.C. 705.128) If the Agency tentatively decides to initiate steps to modify a permit under this Section and 35 Ill. Adm. Code 704.261 through 704.263 or 35 Ill. Adm. Code 730.270 through 703.273 it shall, after giving public notice as though an application had been received (Section 705.161(a)(1), prepare a draft permit under Section 705.141 incorporating the proposed changes. The Agency may request additional information and may require the submission of an updated permit application. For reissued permits, the Agency shall require the submission of a new application.
4. Need to Halt or Reduce Activity. It shall not be a defense for a Permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit. (35 I.A.C. 702.143)
5. Duty to Mitigate. The Permittee shall take all reasonable steps to minimize or correct any adverse impact on the environment resulting from non-compliance with this permit. (35 I.A.C. 702.144)

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6. Proper Operation and Maintenance. The Permittee shall at all times properly operate and maintain all facilities, systems of treatment, and controls (and related appurtenances) which are installed or used by the Permittee to achieve compliance with the conditions of this permit. Proper operation and maintenance includes effective performance, adequate funding, adequate operator staffing and training, adequate laboratory and process controls, and appropriate quality assurance procedures. This provision requires the operation of backups, auxiliary facilities, or similar systems used only when necessary to achieve compliance with the condition of the permit. (35 I.A.C. 702.145)
  7. Property Rights. Issuance of this permit does not convey any property rights of any sort, or any exclusive privilege. (35 I.A.C. 702.147)
  8. Duty to Provide Information. The Permittee shall furnish to the Agency, within the specified times, any information which the Agency may request, to determine whether cause exists for modifying, revoking and reissuing, terminating this permit, or to determine compliance with this permit. The Permittee shall also furnish to the Agency, upon request, copies of records required to be kept by this permit. (35 I.A.C. 702.148)
  9. Inspection and Entry (35 I.A.C. 702.149). The Permittee shall allow an authorized representative of the Agency, upon the presentation of credentials and other documents, as may be required by law, and at reasonable times, to:
    - a. Enter upon the Permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit;
    - b. Have access to and copy any records that must be kept under the conditions of this permit;
    - c. Inspect any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; and
    - d. Sample or monitor for the purposes of assuring permit compliance or as otherwise authorized by the appropriate Act, any substances or parameters at any location.
  10. Monitoring. Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity. (35 I.A.C. 702.150(a))

## 11. Records (35 I.A.C. 702.150(b),(c) &amp; 704.181(b))

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- a. The Permittee shall retain records of all monitoring information, including all calibration, maintenance records, original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least 3 years from the date of the sample, measurement, report, or application. This period may be extended by request of the Agency at any time.
  - b. Retention of records. The Permittee shall retain records concerning the nature and composition of all injected fluids until three years after the completion of any plugging and abandonment procedures specified under 35 I.A.C. 704.188. The Owner or Operator shall continue to retain the records after the three year retention period unless the Owner or Operator delivers the records to the Agency or obtains written approval from the Agency to discard the records.
  - c. Records of monitoring information shall include:
    - i. The date, exact place, and time of sampling or measurements;
    - ii. The individual(s) who performed the sampling or measurements;
    - iii. A precise description sampling methodology and handling;
    - iv. The date(s) analyses were performed;
    - v. The individual(s) who performed the analyses;
    - vi. The analytical techniques or methods used; and
    - vii. The results of such analyses.

## 12. Signatory Requirements. All reports, or information submitted to the Agency shall be signed and certified as required in 35 I.A.C. 702.126. (35 I.A.C. 702.151)

## 13. Reporting Requirements.

- a. Planned changes. The Permittee shall give written notice to the Permit Section, Division of Land Pollution Control within 15 days of any planned physical alterations or additions as to the permitted facility. (35 I.A.C. 702.152(a))

- b. Anticipated noncompliance. The Permittee shall give advance notice to the Permit Section, Division of Land Pollution Control, of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements. (35 I.A.C. 702.152(b)).
- c. Other noncompliance. The Permittee shall report all instances of noncompliance not reported under 35 I.A.C. 702.152 paragraphs (d), (e) and (f) at the time monitoring reports are submitted. The reports shall contain the information referenced in 35 I.A.C. 702.152 Subsection (f). (35 I.A.C. 702.152(g))
- d. A summary of the reporting dates can be found in Attachment H for all information required by this permit.

14. Corrective Action Requirements (35 I.A.C. 704.193)

- a. The permitted well will be immediately shut-in and the Permit Section, Division of Land Pollution Control, will be notified if:
  - i. upward fluid migration occurs through the well bore of any unknown, improperly, or unplugged well(s) due to injection of fluid and/or
  - ii. any problems developed with the casing or components of the injection well.
- b. Any improperly plugged or unplugged well(s) will be plugged and abandoned immediately. A copy of the plugging affidavit(s) filed with the Oil and Gas Division, Illinois Department of Mines and Minerals must be submitted to the Permit Section, Division of Land Pollution Control.
- c. Telephone notification within twenty-four (24) hours of the discovery of the problem and written confirmation transmitted by letter within five (5) days.
- d. In case of well failure the procedures in Attachment F will be followed. An investigation of the indicated well failure and plan of action to eliminate the problem must be conducted and the remedial work performed.

15. Twenty-four Hour Reporting. (35 I.A.C. 702.152(f))

- a. The Permittee shall report to the Permit Section, Division of Land Pollution Control, any noncompliance which may endanger health or the environment. Any information shall be provided orally within 24 hours from the time the Permittee becomes aware of the circumstances.

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- b. A written submission shall also be provided to the Permit Section, Division of Land Pollution Control, within 5 days of the time the Permittee becomes aware of the circumstances. The written submission shall contain:
    - i. a description of the noncompliance and its cause;
    - ii. the period of noncompliance, including exact dates and times;
    - iii. if the noncompliance has not been corrected, the anticipated time it is expected to continue; and
    - iv. steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance.
  - c. The following shall be included as information which must be reported within 24 hours (35 I.A.C. 704.181(d)):
    - i. Any monitoring or other information which indicates any contaminant may cause an endangerment to underground sources of drinking water.
    - ii. Any noncompliance with a permit condition or malfunction of the injection system which may cause fluid migration into or between underground sources of drinking water.
16. Transfer of Permit.
- a. Transfers. This permit is not transferable to any person except after notice to the Agency. The Agency may require modification of the permit to change the name of the Permittee and incorporate such other requirements as may be necessary under the appropriate Act. (35 I.A.C. 702.152(c))
  - b. Transfer by modification. A permit may be transferred by the Permittee to a new owner or operator only if the permit has been modified (under 702.183 through 185), reissued or a minor modification made (under Section 702.187(d)), to identify the new Permittee and incorporate such other requirements as may be necessary under the appropriate Act. The new owner or operator to whom the permit is transferred shall comply with all the terms and conditions specified in such permit. (35 I.A.C. 704.260(a))
17. Financial Responsibility. (35 I.A.C. 704.189) The Permittee shall maintain financial responsibility and resources to close, plug, and abandon the underground injection wells in a manner prescribed by the Agency, and described in Attachment A.
- a. The Permittee must show evidence of financial responsibility to the Agency by the submission of a surety bond, other adequate assurance such as financial statements, or other materials acceptable to the Agency.



- b. The financial documents submitted must be revised and maintained as specified in 35 I.A.C. 704, Subpart G and 40 CFR 144.
18. Cost Estimates for Plugging and Abandonment. (35 I.A.C. 704.212)
- a. The Owner or Operator must prepare a written estimate, in current dollars, of the cost of plugging the injection well in accordance with the plugging and abandonment plan (Attachment A). The cost estimate must equal the cost of plugging and abandonment at the point in the facility's operating life when the extent and manner of its operation would make plugging and abandonment the most expensive.
- b. The Owner or Operator must adjust the cost estimate for inflation no later than November 28th of each year. The adjustment must be made as specified in paragraphs (i) and (ii) of this condition, using an inflation factor derived from the annual Oil and Gas Field Equipment Cost Index. The inflation factor is the result of dividing the latest published annual Index by the Index for the previous years.
- i. The first adjustment is made by multiplying the cost estimate by the inflation factor. The result is the adjusted cost estimate.
- ii. Subsequent adjustments are made by multiplying the latest adjusted cost estimate by the latest inflation factor.
- c. The Owner or Operator must review the cost estimate whenever a change in the plan increases the cost of plugging and abandonment. The revised cost estimate must be adjusted for inflation as specified in paragraph (b).
- d. The Owner or Operator must keep the following at the facility during the operating life of the facility:
- i. the latest cost estimate prepared in accordance with paragraphs (a) and (c) and,
- ii. the latest adjusted cost estimate prepared in accordance with paragraph (b).
19. Closure. (35 I.A.C. 730.171) The permittee shall maintain and comply with the approved plan for closure of the well which is described in Attachment I and meets the requirements of this section.
20. Post Closure Care (35 I.A.C. 730.172). The owner or operator shall maintain and comply with a approved Post-Closure Care plan in Attachment J and which meets the requirements of this section.

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21. Financial Responsibility for Post-Closure Care (35 I.A.C. 730.173) The owner or operator shall demonstrate and maintain financial responsibility for post-closure care by using a trust fund, surety bond, letter of credit, financial test, insurance or corporate guarantee that meets the specifications for the mechanisms and instruments revised as appropriate to cover closure and post-closure care in 35 Ill. Adm. Code 704, Subpart G. The amount of the funds available must be no less than the amount identified in Section 730.172(a)(4)(F). The obligation to maintain financial responsibility for post-closure care survives the termination of a permit or the cessation of injection.
22. Incapacity. (35 I.A.C. 704.230)
- a. An owner or operator shall notify the Permit Section, Division of Land Pollution Control, by certified mail of the commencement of a voluntary or involuntary proceeding under 11 U.S.C. (Bankruptcy), naming the owner or operator as debtor, within 10 business days after the commencement of the proceeding. A guarantor of a corporate guarantee as specified in 35 I.A.C. 704.219 must make such a notification if the guarantor is named as debtor, as required under the terms of guarantee in 35 I.A.C. 704.240.
  - b. An owner or operator who fulfills the requirements of 35 I.A.C. 704.213 by obtaining a letter of credit, surety bond or insurance policy will be deemed to be without the required financial assurance in the event of bankruptcy insolvency or a suspension or revocation of the license or charter of the issuing institution. The owner or operator must establish other financial assurance within 60 days after such an event.
23. Revocation of Permits. (35 I.A.C. 702.186) The Illinois Pollution Control Board will revoke a permit during its term in accordance with Title VIII of the Illinois Environmental Protection Act or the Agency will deny permit renewal for the following causes:
- a. The Permittee's violation of the Environmental Protection Act or regulations adopted thereunder;
  - b. Noncompliance by the Permittee with any condition of the permit;
  - c. The Permittee's failure in the application or during the permit issuance process, to disclose fully all relevant facts, or the Permittee's misrepresentation of any relevant facts at any time; or
  - d. A determination the permitted activity endangers human health, or the environment and can only be regulated to acceptable levels by permit modification or revocation.

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24. State Mining Board Permits. Issuance of this permit does not relieve the Permittee of the responsibility of complying with the provisions of Illinois State Mining Board Rules and Regulations and an Act in Relation to Oil, Gas, Coal, and Other Surface and Underground Resources. (Rule II, Illinois Department of Mines and Minerals Rules and Regulations)
25. False or Omitted Information.
  - a. The Permittee shall not make any false statement, representation, or certification in any application, record, report, plan, or other document submitted to the Agency, the United States Environmental Protection Agency (USEPA), or required to be maintained under this permit.
  - b. If, or when, the Permittee becomes aware of a failure to submit any relevant facts in a permit application or incorrect information was submitted in a permit application or in any report to the Agency, the Permittee shall promptly submit such facts or correct information to the Permit Section, Division of Land Pollution Control within ten (10) days. (35 I.A.C. 702.152(h))
26. Restriction on Unpermitted Waste. No waste streams other than those noted in the permit shall be injected. The Permittee shall submit to the Permit Section, Division of Land Pollution Control, on January 15 of each year, a certified statement attesting compliance with this requirement during the previous calendar year. (35 I.A.C. 702.160)
27. Plugging and Abandonment.
  - a. The Permittee shall plug and abandon the injection well in accordance with the schedule and provisions of the approved plugging and abandonment plan herein incorporated as Attachment A. (35 I.A.C. 704.188)
  - b. No later than 30 days after plugging and abandonment the Permittee shall submit a plugging report to the Planning & Reporting Section, Division of Land Pollution Control. The report shall be certified as accurate by the person who performed the plugging operation, and shall consist of:
    - i. A statement that the well was plugged in accordance with the plan most recently submitted to the Agency; or
    - ii. A statement defining the actual plugging and explaining why the Agency should approve such deviation, if the actual plugging differed from the approved plan. Any deviation from a previously approved plan which may endanger underground sources of drinking water is cause for the Agency to require the operator to replug the well; and

- iii. Copy of the Illinois Department of Public Health well sealing form submitted to the Vermilion County Health Department.
- c. If the approved plugging and abandonment plan requires a change, a revised plan shall be submitted to the Permit Section, Division of Land Pollution Control for approval. If approved, the revised plugging and abandonment plan will replace Attachment A and become a part of this permit as a minor modification.
28. Conversion or Abandonment. The Permittee shall notify the Permit Section, Division of Land Pollution Control, 45 days prior to conversion or abandonment of the wells. Plans for plugging and abandonment or conversion must be submitted 180 days prior to actual conversion or abandonment. (35 I.A.C. 704.181(e))
29. Inactive Wells. (35 I.A.C. 704.188) After cessation of injection for two (2) years the Permittee shall plug and abandon the well in accordance with Attachment A of this permit and 35 I.A.C. 730.110 unless the Permittee has:
- a. Provided notice to the Permit Section, Division of Land Pollution Control; and
- b. Described actions or procedures, which are deemed satisfactory by the Agency, to ensure the well will not endanger underground sources of drinking water during the period of temporary abandonment. These actions and procedures shall include compliance with the technical requirements applicable to active injection wells, including mechanical integrity testing, unless waived by the Agency in writing.
30. Mechanical Integrity. (35 I.A.C. 704.190, 730.168(d))
- a. A demonstration of mechanical integrity in accordance with Attachment B of this permit shall be conducted to ensure the well has integrity during the life of this permit. A descriptive report interpreting the results shall be submitted with log analyses to the Permit Section, Division of Land Pollution Control, by an independent log analyst.
- b. The Permittee will demonstrate the absence of significant leaks in the casing, injection tubing, and packer by use of a pressure test to be conducted annually and whenever there has been a well workover.

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- c. The Permittee will demonstrate the absence of significant fluid movement into an underground source of drinking water through vertical channels adjacent to the injection well bore by use of a temperature log at least once every two years for the casing and a radioactive tracer survey run through the tubing to be conducted annually.
- i. The well shall be shut-in for at least 48 hours, unless prior approval is obtained from the Agency, to allow stabilization prior to running the temperature log.
  - ii. A temperature log will be run while the tool is lowered into the well.
  - iii. A base temperature log and a minimum of 3 post temperature logs shall be run.
- d. The Permittee shall test the bottom hole cement by use of an approved radioactive tracer survey to be conducted annually.
- e. Any Agency approved changes to the mechanical integrity testing procedures will become part of Attachment B of this permit as a minor permit modification.
- f. In addition to the pressure test, temperature log and radioactive tracer survey the Permittee will inform the Permit Section, Division of Land Pollution Control of any additional mechanical test, logs, or inspections at least thirty (30) days prior to the demonstration of mechanical integrity.
- g. A cement bond log must be run in the entire length of the long string casing at least once every four years.
- h. An electromagnetic log shall be run to determine the thickness and condition of the long string casing for its entire length. This log shall be run at least once every two years.
- i. The Permittee shall notify the Permit Section, Division of Land Pollution Control of their intent to demonstrate mechanical integrity at least thirty (30) days prior to a demonstration. The type of test must be specified in the notice.

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- j. The Permittee shall cease injection if a loss of mechanical integrity as defined by 35 I.A.C. 730.108, or Attachment B of this permit, becomes evident during operation or at the time of the mechanical integrity demonstration. Operation shall not be resumed until the Permittee has complied with the provisions of this permit regarding mechanical integrity demonstration and testing.
  - k. All gauges used in mechanical integrity demonstrations or in daily operations shall be calibrated according to the procedures of the National Bureau of Standards, initially and at least annually thereafter. A copy of the calibration certificate shall be submitted to the Planning and Reporting Section on January 15 of each year. In addition, recording devices will be time synchronized at least quarterly.
  - l. In addition to the mechanical integrity demonstration required by this permit, the Agency may require the Permittee to conduct a demonstration of mechanical integrity of the well when evidence reasonably indicates that the integrity of the well is in question.
  - m. By giving notice at least six (6) months prior to a scheduled mechanical integrity test, the Permit Section may require that additional logs be run to clarify any specific anomalies or ambiguous results from previous testing. This may include a repeat of previous logs and/or supplemental logs such as Radial Differential Temperature or Pulse Echo Technique logs.
31. Contingency Plan. The Permittee shall follow the contingency plan outlined in Attachment F. (35 I.A.C. 702.160)
32. Neutralization. The Permittee will operate and maintain a system for neutralization ( $5 < \text{pH} < 10$ ) of the plant process wastewater.
33. Continued Releases at Permitted Facilities. Issuance of this Underground Injection Control (UIC) permit does not release the Permittee from complying with applicable requirements of the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act of 1976, as amended (42 USC., Sec. 6901 et seq., commonly known as RCRA), and the 1984 Hazardous and Solid Waste Amendments (HSWA). In particular, Section 3004(u) of HSWA requires owner/operators of hazardous waste treatment, storage and disposal facilities seeking permits to take corrective action for all releases of hazardous waste or hazardous waste constituents from any solid waste management unit (SWMU), which includes the injection well. If at any time, the IEPA should determine that a release of hazardous waste or hazardous waste constituents is taking, or has taken place from

the well or the injection zone, corrective action requirements and a schedule for their completion may be imposed under Section 3004(u) and 3008(h) HSWA. This permit does not constitute a RCRA permit-by-rule for any part of the facility except the injection well, and, further, does not release the Permittee from complying with the corrective action requirements for other SWMUs at the same facility, nor any other RCRA and HSWA regulations applicable to units and operations at this facility.

34. Restrictions on Future Land Use of Hazardous Facilities. (35 I.A.C. 724.219 & 220) Within 90 days after final plugging and abandonment, the owner or operator must submit to the Planning & Reporting Section, Division of Land Pollution Control, to the County Recorder, and to any local zoning authority a survey plat indicating the location of the disposal well with respect to permanently surveyed bench-marks. The plat must be prepared and certified by a professional land surveyor. In addition, the owner or operator must submit to the Agency, the County Recorder and any local zoning authority a record of the type, location and quantity of hazardous waste placed in each well. For wastes disposed before October 12, 1983, the owner or operator must identify the type and quantity of the wastes to the best of their knowledge and in accordance with any record which has been kept. Any changes in the type, location or quantity of hazardous wastes disposed within the facility which occurred after the survey plat and record of wastes had been filed must be reported to the agencies where original plat and record were filed.

The owner of the property where a disposal well is located must record, in accordance with Illinois law, a notation on the deed to the facility property, or on some other instrument normally examined during a title search, to notify, in perpetuity, any potential purchaser of the property of the following:

- a. the land has been used for disposal of hazardous waste;
- b. the steel plate and cement plug in the well must never be disturbed or removed;
- c. the survey plat and record of the type well location, and quantity of hazardous waste has been filed with the Illinois Environmental Protection Agency, the County Recorder, and any local zoning authority.

## Attachment A

PROCEDURE FOR PLUGGING AND ABANDONMENT OF WASTE  
DISPOSAL WELL #1

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1. Displace the tubing and wellbore with sufficient fresh water to flush all waste out of the tubular goods and near wellbore area. Remove all flow lines, associated equipment and instrumentation from wellhead and immediate area.
2. Move in well service rig, including temporary storage tanks, pump and pipe racks.
3. Kill well with adequately weighted water to place fluid level below the well head and prevent the backflow of waste.
4. Remove wellhead. Fill mud tanks with fresh water.
5. Pull out of hole laying down 2 7/8" and 2 3/8" fiberglass injection tubing. Fibercast tubing does not have sufficient strength to use during plugging and abandonment procedures therefore a steel workstring will be required.
6. Rig up wireline unit and run appropriate logs (including electrical logs) and tests to determine casing condition and determine if channeling has developed behind the 7"/5 1/2" and 7"/4 1/2" protective casing. Also, if it is technically feasible, determine if the cement plug from 4025 feet to 4154 feet is leaking. Rig down wireline service unit. Correct any problems as required.
7. Make up 3 7/8" drill bit and casing scraper on workstring and trip in hole to bottom of 4 1/2" Fiberglass casing (about 3613'). This step will gauge and prepare the 4 1/2" casing for running a cement retainer. Pull out of hole, lay down bit and scraper.
8. Rig up cementing equipment. Make up 4 1/2" cement bridge plug retainer and run in hole to the 4 1/2" Fiberglass casing. Set bridge plug retainer at 3610±. Mix and pump sufficient epoxy resin cement (approx. 88 gallons) to form a plug from 3610± to 3500±. Pick up workstring to 3400' and circulate workstring clean. Pull out of hole.
9. Allow resin cement to set overnight before tagging top of plug to confirm proper set-up. Pressure test plug to 1000 psig.
10. Mix and pump Class "A" cement from the top of the epoxy cement plug to about 1870 feet (approx. 180 sacks). Pull workstring to about 1690 feet and circulate the workstring clean. Wait on cement (about 4 hours) and confirm location by tagging.
11. Rig up perforating unit and perforate through 5 1/2" and 7" casing into 7" x 9 5/8" annulus at about 1865'.
12. Displace oil in 7" x 9 5/8" annulus by circulating with water or chemical flush then displace with Class "A" cement from about 1865' to the surface (approx. 265 sx).



13. Fill the 5 1/2" casing with cement to the surface (approx. 207 sacks).
14. Remove bradenhead, cut casings off at 3' below grade and weld 1/2" plate with 1 inch bleed valve across 13 3/8" surface pipe. Inscribe on plate, in a permanent manner, the following information: (1) operator name, (2) closure date and (3) UIC permit number.
15. Release all equipment and clean up location.
16. Submit closure data to regulatory agency.
17. File a well sealing report on Illinois Department of Public Health form with the Vermilion County Health Department. A copy of this report shall be filed with the Permit Section, Division of Land Pollution Control within 30 days following plugging and abandonment.

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## Attachment B

## PROCEDURES USED FOR MECHANICAL INTEGRITY

Pressure Test

1. Shut off all sources of process waste water and inject a minimum of 1100 gallons of "city" water into well.
2. Shut down deepwell and depressurize inner annulus by backflowing annulus kerosene into the surface kerosene tank.
3. Remove well head shed, dismantle surface waste water transfer line.
4. Move in well service rig and pull out injection tubing while adding a small amount of water into the casing to displace the volume of injection tubing removal.
5. Insert a casing plug near the bottom of the 5 1/2" casing.
6. Fill annulus with water and allow temperature to stabilize.
7. Pressure the casing with water to 500 psig and wait sufficient time, at least four (4) hours, to allow for temperature stabilization. Then, repressurize to 500 psig if necessary, and shut in the well for 2 hours to determine the integrity of casing.
8. Pressurize the 9 5/8 inch and 7 inch annulus space to 100 psig and wait sufficient time to allow for temperature stabilization. Repressurize if necessary, and shut in for 1 hour to determine the integrity of the annular space.
9. Corrective action will be taken if the pressure change is more than 3 percent for any 1 hour period during the test of either annulus.
10. Remove casing plug.
11. If needed, address any well deficiencies as required.
12. Install injection tubing (previously surface pressure tested to 300 psig).
13. Install surface transfer line and well shed, repressurize inner annulus to normal operating pressure (200-255 psig).
14. Partially backflush annulus kerosene to assure proper operation of electrode monitoring system.
15. Repressurize annulus to normal operating pressure and start up well.
16. Verify proper operation of well by visually inspecting surface lines and monitoring the annular fluid conductivity, injection and annulus pressures, electrode wire continuity and injection flow rate.

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17. The data obtained, including recording charts from the testing, shall be submitted to the Planning and Reporting Section, Division of Land Pollution Control. The test data must be submitted with the second monthly report submitted to the Agency following the test. A technical evaluation shall accompany all test results.

#### Quarterly Conductivity Test

1. Insure that pH range of 5-10 has been maintained for at least 12 hours prior to backflowing annulus kerosene.
2. Depressurize inner annulus by backflowing annulus kerosene into the surface kerosene tank allowing the waste/kerosene interface to move up the annular space.
3. As the interface contacts the electrodes, an increased conductivity of annular fluid should be detected by the monitoring system.
4. The detection of higher conductivity should alert the well operator by:
  - a. direct readout of the conductivity meters
  - b. visual alarm
  - c. audio alarm
  - d. printout of the "alarmed" conductivity on the monitoring system
5. After the above alarm systems have been activated, the inner annulus shall be repressurized to the normal operational pressure (200-255 psig).
6. Failure to detect higher conductivity constitutes a well failure and appropriate action will be taken.

#### Temperature Log

1. Shut off all sources of process waste water and inject a minimum of 1100 gallons of "city" water into the well.
2. Shut down well and depressurize inner annulus by backflowing annulus kerosene into surface kerosene tank.
3. Remove well shed and dismantle surface waste water transfer line.
4. Move in well service rig and pull out injection tubing while adding a small amount of water into the casing to displace the volume of injection tubing removed.
5. Wait 48 hours after completing step 1 (above) to initiate temperature log.
6. Run baseline temperature survey from the surface down, for the entire length of the well.

NOTE: All temperature surveys will be run into the well.

7. Install injection tubing.
8. Repressurize inner annulus to normal operating pressure (200-255 psig).

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9. Install surface transfer line and well shed.
10. Partially backflush annulus kerosene to assure proper operation of electrode monitoring system.
11. Repressurize annulus to normal operating pressure and start up the well.
12. Verify proper operation of the well by visually inspecting surface lines and monitoring the annulus fluid conductivity, injection and annulus pressure, electrode wire continuity and injection flow rate.
13. The data obtained, including recording charts from the testing, shall be submitted to the Planning and Report Section, Division of Land Pollution Control. The test data must be submitted with the second monthly report following the test. A technical evaluation shall accompany all test results.

#### Radioactive Tracer Survey

1. Shut off all sources of process waste water and inject a minimum of 1100 gallons of "city" water into the well.
2. Remove well shed and dismantle surface waste water transfer line.
3. Set up relatively constant injection of 10 to 20 gpm city water.
4. Move in and set up RAT rig and tool.
5. Reposition the tool and eject a small amount of iodine or equivalent into the well and track the tracer in the tubing to verify the absences of tubing leaks.
6. Position the tool at the bottom of the injection tubing and eject another slug of iodine tracer or equivalent into the well.
7. Reposition the tool at the top of the injection zone and wait a period of time that it would take to show the absence of vertical migration.
8. Remove tool, install surface transfer line, and well shed.
9. Verify proper operation of the well by visually inspecting surface lines and monitoring the annulus fluid conductivity, injection and annulus pressures, electrode wire continuity and injection flow rate.
10. The data obtained, including recording charts from the testing, shall be submitted to the Planning and Reporting Section, Division of Land Pollution Control. The test data must be submitted with the second monthly report following the test. A technical evaluation shall accompany all test results.

#### PRESSURE BUILDUP AND FALL-OFF TEST

1. Shut off all sources of process waste water and inject a minimum of 1100 gallons of "city" water into well.

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2. Shut down deepwell and depressurize inner annulus by backflowing annulus kerosene into the surface kerosene tank.
3. Remove well head shed, dismantle surface waste water transfer line.
4. Move in well service rig and pull out injection tubing while adding a small amount of water into the casing to displace the volume of injection tubing removal.
5. Move in and set up wireline truck with a suitable bottom hole pressure monitoring tool. Accurately locate the tool in the injection interval.
6. Inject a minimum of 75 gpm fresh water into the well. Maintain a steady flow for 8 hours, or less, if a semi-log plot of pressure versus time becomes linear. Record and plot pressure buildup curve.
7. Shut off fresh water flow. Continue recording pressure fall-off for 2 hours. Record data at sufficient frequency to accurately characterize the pressure behavior event and pressure fall-off curve.
8. Remove pressure monitoring tool.
9. Install injection tubing.
10. Repressurize inner annulus to normal operating pressure (200-255).
11. Install surface transfer line and well shed.
12. Partially backflush annulus kerosene to assure proper operation of the electrode monitoring system.
13. Repressurize annulus to normal operating pressure and start up well.
14. This test checks pressure buildup in the injection zone. The data obtained, from the testing shall be submitted to the Planning and Reporting Section, Division of Land Pollution Control. The test data must be submitted with the second monthly report submitted to the Agency following the test. A technical evaluation shall accompany all test results.

#### CASING INSPECTION LOG and CEMENT BOND LOG

A reputable wireline logging service shall conduct the log(s) using appropriate equipment. The recommended practice for use of the proprietary tool(s) shall be followed.

<u>Summary of Mechanical Integrity</u>	
<u>Test/Log</u>	<u>Frequency</u>
Pressure test	annual
temperature log	two years

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DRAFT PERMIT

UIC-010-W1-AC

radioactive tracer  
survey                      annual

pressure buildup  
and fall-off test              annual

casing inspection log      two years

cement bond log              four years

NOTE: The first regularly scheduled mechanical integrity tests after the effective date of this permit may be conducted in the month following their normally scheduled date.

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## Attachment D

## PARAMETERS FOR WASTE MONITORING PROGRAM

<u>Parameter</u>	<u>Waste Frequency*</u>
Total Acidity	W**
Chloride (mg/l)	W
Fluoride (mg/l)	W
Potassium (mg/l)	W
Sodium (mg/l)	W
Free Chloride (mg/l)	W
Specific Gravity	W
Nickel (mg/l)	W
Arsenic (mg/L)	W
Suspended Solids (mg/l)	W
Viscosity (Centipoise)	M
Phenolics, total recoverable (ug/l)	M
Total Organic Carbons (TOC)	W
Total Organic Halogen (TOX)	W
Organic scan (ppb) (unfiltered)	Q
pH (Units)	C
Temperature (°F)	C
Total Dissolved Solids (mg/l)	W
Carbon Tetrachloride (mg/l)	W
Chloroform (mg/l)	W

\*\* Monitoring of total acidity may be waived by the Agency as a minor modification upon demonstration by the Permittee that the neutralization system is operating in a stabilized and satisfactory manner.

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## Attachment E

## PROCEDURE FOR CALCULATING AVERAGE VALUES

$$\text{Daily Average Flow Rate} = \frac{\text{Total volume injected (gal/day)}}{(\text{total hrs. of injection/day}) (60 \text{ min./hr})}$$

$$\text{Monthly Average Flow Rate} = \frac{\text{Total volume injected (gal/month)}}{(\text{total hrs. of injection/month}) (60 \text{ min./hr})}$$

The annulus pressure and injection pressure averages are to be calculated by an integration of the curve. The values for the annulus pressure average are the values at the beginning of each day, including all values during the day, and ending with the value at the end of each day. The monthly annulus pressure average is calculated with all values from the beginning of each month, to the end of the month.

The daily injection pressure average includes all values that occur during the day, all "zero" startup values, and "zero" shutdown values, etc. On days with 24 hours of injection, the values from the beginning of the day to the end of the day are to be used. The monthly injection pressure average will include all injection pressure values that occur during the month, including startups, shutdowns, and continuous injection values.

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## Attachment F

## PROCEDURE FOR WELL OR EQUIPMENT FAILURE

The injection well has the following alarms which are designed and maintained to alert the operator of potential well failures:

Annular Fluid High Conductivity. This alarm is activated when the conductivity of the annular fluid in the area surrounding the electrodes increases beyond the alarm setting of 4,000 micromhos/centimeter.

Electrode Wire Continuity Break. This alarm signals the operator when a failure exists in the electrode wiring.

Well Head Rupture Disk Alarm. This alarm signals the operator when the 90# rupture (max operating pressure = 100 psi) disk, which is located on the transfer/injection line immediately above the well head, has ruptured.

Alarm systems for maximum flow rate and minimum annulus pressure shall be installed within 90 days of the effective date of this permit.

In addition to the above alarms, the following monitoring devices are used to monitor for proper well operation:

Inner Annulus Pressure Gauge (200-255 psig)  
Inner Annulus Pressure Recorder  
Outer Annulus Pressure Gauge (50-80 psig)  
Outer Annulus Pressure Recorder  
Injection Flow Rate Meter (125 gpm max)  
Injection Flow Rate Recorder  
Injection Temperature Gauge (N/A)  
Injection Temperature Recorder  
Injection Pressure Gauge (100 psig max)  
Injection Pressure Recorder  
Conductivity/Continuity Recorder  
Flow Totalizer  
pH recording device (5-10 psi)

Any circumstances that reasonably indicate a possible well failure require immediate action of the operator including:

- 1) Shut off waste water flow to the well. Flush tubing with fresh water.
- 2) Notify supervisor.
- 3) Kerosene may have to be added to the annulus to determine if a failure has occurred.
- 4) Identify and repair the exact failure.

Any indication of a possible well failure requires immediate notification of a plant supervisor. The Agency shall be notified within 24 hours after loss of mechanical integrity or possible well failure is discovered. In the event of a surface failure such as a transfer line leak, the well will be shut down and repaired prior to further well operation.

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In addition to actual mechanical well failures, the well will be shut down if it cannot be operated within the limits specified in the permit, (those being 100 psig injection pressure, 125 gpm injection rate, and 200-255 psig annulus pressure) unless prior approval is obtained from the Agency.

In the event of a prolonged well failure, the plant will have to be shutdown with the exception of operating a boiler for heating purposes during cold weather. In this worst case scenario, the plant would generate approximately 400 gallons per day of waste water from boiler operation, 25 gallons per day of waste water for scrubber operations and an average of 3800 gallons per day of collected rainfall. Given an "on-hand" storage capacity of approximately 480,000 gallons, this plant could operate in this mode for 114 days. If for any reason the deepwell would not be expected to be made operational during this period, the boiler would be shut down, acid storage would be emptied (negating the need for scrubbers) and rainwater diverted such that it would not collect in the process sewers. These actions would totally eliminate all sources of the deepwell effluent.

One of the following personnel will be notified by the shift supervisor if a possible well failure occurs:

Env. Supervisor	431-0863
Plant Manager	446-7133
Mgr. Maint./Engr.	443-5922
Production Mgr.	427-5480
Technical Supervisor	446-7838

The Agency will be notified per permit conditions and applicable regulations.

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UIC-010-W1-AC

Attachment G

GROUNDWATER MONITORING

The Agency has accepted Allied's Hazardous Waste Disposal Injection Restriction (HWDIR) exemption petition demonstration as the required Groundwater Monitoring Plan waiver demonstration. This HWDIR exemption petition was approved by the USEPA on May 8, 1990.

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## Attachment H

## SUMMARY OF SUBMITTAL DATES

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The following is a summary of submittal dates for data required by this permit. The referenced condition must be consulted for complete details.

<u>Condition</u>	<u>Submittal</u>	<u>Date Due</u>
A 5	Change in Tubing	30 days prior to installation
B 1(j)(ii,iii)	Installation of Alarm Systems	90 days after effective date of this permit
B 2(b)(vi)	Recording Devices	30 days after effective date of this permit
	Installation of Recording Devices	60 days after effective date of this permit
B 4	Monthly Operation Reports	15th each month
H 2	Duty to Reapply	180 days prior to expiration
H 12(a)	Planned Changes	15 days prior to planned changes
H 13	Corrective Action Requirements by Telephone	24 hours after the discovery
	by Letter	5 days after the discovery
H 14	Endangerment of Environment by Telephone	24 hours of the time of endangerment
	by Letter	within 5 days of endangerment
H 19(b)	Plugging and Abandonment Cost Estimates for Inflation	November 28 each year
H (a)	Bankruptcy	23 days after commencement of the proceeding
H (b)	Alternative Financial Responsibility	60 days after declaration of bankruptcy
H (b)	Correction of False or Omitted information	10 days after the discovery

## DRAFT PERMIT

UIC-010-W1-AC

H	Restriction of Injected Substances	Jan. 15th of each year
H (b)	Certification of Plugging and Abandonment	30 days after plugging
H	Plans for Conversion or Abandonment	180 days prior to actual conversion or abandonment
H	Notify before Conversion or Abandonment	45 days prior to conversion or abandonment
H (b)	Intent to demonstrate mechanical integrity	30 days prior to demonstration
H (e)	Additional Mechanical Integrity Testing	30 days prior to demonstration
H (g)	Intent to demonstrate mechanical integrity	30 days prior to demonstration
H 26(i)	Gauge calibration	Jan. 15 of each year
H 29	Restriction on Future Land Use	90 days after plugging and abandonment

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## CLOSURE PLAN

**DRAFT**

This closure plan is prepared pursuant to 35 Ill. Adm. Code Section 730.171 requirements and shall be kept at the facility at all times. Allied shall notify the Agency at least 60 days before planned closure of the well as required by 35 Ill. Adm. Code Section 730.171(b). Allied will also submit any proposed significant revision to the method of closure reflected in the plan for approval for the Agency at the time of closure notification. The estimated cost of closure is included in Form 4G Attachment 2 and the financial responsibility demonstration for closure cost estimate is included in Form 4 Attachment 4 of the permit application.

The detailed procedures for plugging and abandonment of Allied's underground injection well #1 are described in Attachment A. Prior to well closure, the well shall be flushed with fresh water and the following MIT tests will be performed:

1. Casing Pressure Test
2. Casing Radioactive Tracer Test
3. Temperature Log
4. Cement Bond Log
5. Caliper Log
6. Casing Inspection Log
7. Pressure Buildup and Fall-Off Test

Placement of the cement plugs shall be accomplished by the balance method and the plug shall be appropriately tagged and tested for seal and stability as described in the plugging and abandonment procedures. Within 60 days after closure, Allied shall submit a closure report to the Agency. The report shall be certified by Allied or Allied's consultant and shall consist of either:

1. A statement that the well was closed in accordance with the closure plan submitted and approved by the Agency; or
2. Where actual closure differed from the submitted plan, a written statement specifying the differences between the submitted plan and the actual closure.

## Attachment J

## POST CLOSURE PLAN

**DRAFT**

This post closure plan is prepared pursuant to 35 Ill. Adm. Code Section 730.172 and shall be kept at the facility at all times. Allied will submit any proposed significant revision to the plan, as appropriate, over the life of the deepwell, but no later than the date of the closure report required under 730.171(c).

A. Conditions at Time of Well Closure

The measured downhole pressure before injection began was listed in the Well Completion Report to be 1570 psi at the depth of Number 2 Drill Stem Test (3843 feet to 3933 feet). The downhole pressure was measured in March of 1989 with a pressure measuring device accurate to  $\pm .01$  psi. The measured pressure at that time was 1541.8 psi and is felt to be the most reliable indication of downhole pressure since it is in agreement with historical annulus pressures (See Figure 3-10 of Groundwater Monitoring Waiver Demonstration).

The multi-layer pressure modeling performed in Section 3.2.4 of the Groundwater Monitoring Waiver Demonstration indicated a 1.7 psi buildup at the end of 2003 using an average injection rate of 60 gpm. This results in an anticipated injection zone pressure at the end of 2003 of 1543.5 psi. (For the purposes of this plan, the date of closure is assumed to be the year 2003).

At current and maximum injection rates, the cone of influence of the deepwell will never intersect the base of the lowermost USDW. We calculate the radius of the cone of influence by finding the intersection of the potentiometric surface (plane) of the deepwest USDW and the pressure cone from Figure 4-3, Form 4D, Attachment 1 of the renewal application. We do not have measurements of potentiometric surface for the deepest USDW but potentiometric measurements have been made for the St. Peter Sandstone at the Mahomet and the Crescent City sites. The measured heads are 526 ft. and 505 ft. respectively. We therefore use an average head of 516 ft. for the St. Peter at the Allied-Signal site. Since the maximum head for the injection operation has been calculated to be 505 ft. in the year 2003 (see Figure 4-3, Form 4D, Attachment 1), there is no intersection of the two surfaces and the radius of the cone of influence is zero. Form 4D, Attachment 1 indicates a cone of influence of 10 to 20 ft. because the St. Peter head was very conservatively assumed to be about 505 ft.

The predicted position of the waste front at closure (which is assumed to be the year 2003) is about 0.54 miles radially from the well bore (See Section 3, Table 3-1 of Groundwater Monitoring Waiver Demonstration). This predicted position is based upon the most probable assumption that the injection interval is 200 feet thick, and its porosity is 8%. The injection flow is assumed to be 60 gallons per minute.

**B. Post-Closure Activities**

Upon closure, a survey plat will be submitted to the local zoning authority. This plat will indicate the location of the well relative to permanently surveyed benchmarks. A copy of this plat will be submitted to US EPA, Region V. Also upon closure, the Illinois Department of Mines and Minerals and the State Department of Public Health will be notified as to the depth and location of the well and confining zone.

Records reflecting the nature, composition, and volume of all injected fluids will be retained for at least three years following the well closure. Such records shall be delivered to the Agency at the conclusion of this three-year retention period. As required, Allied will also comply with the Responsible Property Transfer act of 1988.

The following notifications shall be recorded on the deed to the facility property:

1. The fact that the land has been used to manage hazardous waste.
2. The names of the Illinois Department of Mines and Minerals and the local zoning authority with which the plat was filed as well as the address of Region V Environmental Protection Agency.
3. The type and volume of waste injected, the injection interval or intervals into which it was injected, and the period over which injection occurred.

**C. Financial Assurance**

The estimated costs of proposed post-closure care are minimal, primarily administrative expenses, and are more than adequately covered in the closure cost contingency.

Allied is demonstrating financial responsibility through the financial test. Allied meets the financial test requirements and chooses to demonstrate this by the mechanisms described in Section 704.219(a)(2). As indicated in Allied's attached updated financial data submitted to Mr. Andrew Vollmer of IEPA on March 22, 1990 Allied-Signal's current bond rating by Standard and Poor's is an "A" rating; the Corporation's tangible net worth is at least six times the sum of Allied-Signal's financial responsibility under Ill. Adm. Code 704.189 and other equivalent state regulations currently met using the financial test or corporate guarantee. The Corporation's tangible net worth is greater than \$10 million, and the Corporation's total assets in the United States are at least six times the sum of Allied-Signal's financial responsibility under Ill. Adm. Code 704.189.

The copies of required documents signed by Allied-Signal's Chief Financial Officer, and Allied-Signal's independent accountants, Price Waterhouse are included in Form 4, Attachment 4 of the renewal application.

RS:bjh/sp/365q





217/782-6762 -

Refer to: 1838040027 -- Vermilion County  
Danville/Allied Signal, Inc. Well WDW #1  
ILD005463344  
UIC Administrative Record - Log #137UIC

May 7, 1991

Allied-Signal, Inc.  
Attn: Don Phillips, Plant Manager  
Post Office Box 13  
Danville, Illinois 61834

Dear Mr. Phillips:

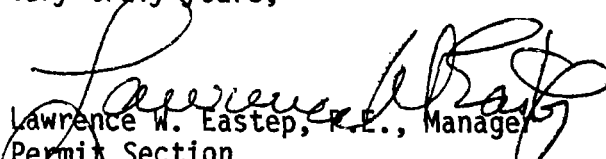
Your application to renew Permit #UIC-003-W1-AC which is currently under review requests the addition of a waste stream consisting of groundwater from recovery wells. It appears that this waste stream may be hazardous by its characteristic of toxicity (Title 35 I.A.C., 721.124) and/or as a listed hazardous waste (Title 35 I.A.C. 721.133(d)).

In order to be approved for disposal it must be reasonably demonstrated that a hazardous waste stream cannot be recycled for reuse, nor incinerated or chemically, physically or biologically treated so as to neutralize the hazardous waste and render it nonhazardous (Section 39(h) of the Environmental Protection Act).

Within 30 days of receipt of this letter please provide documentation that the proposed waste stream cannot reasonably be dealt with in an alternative manner as required by Section 39(h) of the Act or that it is not hazardous as defined in Section 721 of Title 35, Illinois Administrative Code. To assist in the former, a copy of Form LPC-PA10, Request for Authorization to Deposit Hazardous Waste, and instructions are enclosed.

If you have any questions concerning this matter please contact Ron Steward at 217/782-6762.

Very truly yours,

  
Lawrence W. Eastep, P.E., Manager  
Permit Section  
Division of Land Pollution Control

<sup>RRS</sup>  
LWE:RRS:bjh/1293q/64  
<sub>3</sub>

Enclosures: LPC-PA10  
Instructions for LPC-PA10

cc: Champaign Region  
Planning & Reporting Section  
Division File - UIC Administrative Record  
George Hudak, USEPA, Region V, 5WD-TUB-9 ✓  
Edward Smith, ISGS  
Mr. Alberto Nieto  
Ron Steward

USEPA



Illinois Environmental Protection Agency · P. O. Box 19276, Springfield, IL 62794-9276

217/782-6762

UIC Log 68

Refer to: 1838040027 -- Vermilion County  
Danville/Allied-Signal, Inc. -- Well #1  
ILD005463344  
UIC-003-W1-AC  
UIC Administrative Record

April 11, 1989

Allied Corporation  
Attn: Don Phillips, Plant Manager  
Post Office Box 13  
Danville, Illinois 61834-0013

Allied-Signal, Inc.  
Attn: James Cooper  
Post Office Box 2332R  
Morristown, New Jersey 07960

Dear Mr. Phillips:

Enclosed is the modified permit which you requested in your November 22, 1988, January 10, 1989 and February 17, 1989 letters. The following pages contain changes that have been incorporated into the permit as minor modifications.

<u>Page</u>	<u>Condition</u>	<u>Changes</u>
3	I.B.1.d	Change inner annulus pressure range from 215-255 psig to 200-255 psig.
7	I.B.5.e	Change contact persons for the ISGS and ISWS.
17	I.H.26	Change item b to require annual testing and item c to read "at least once every two years."
29	Attachment D	Use potassium hydroxide (KOH) in place of sodium hydroxide (NaOH) as the caustic agent for the plant's emergency vent scrubber (EVS) system.

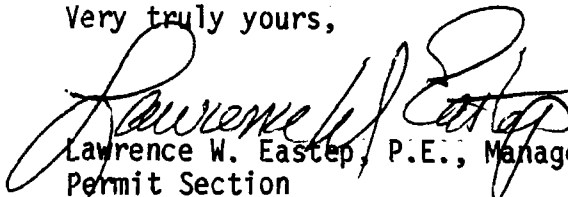
47



Page 2

If you have any questions concerning these changes, please contact Douglas W. Clay at 217/782-6762.

Very truly yours,

  
Lawrence W. Eastep, P.E., Manager  
Permit Section  
Division of Land Pollution Control

LWE:DWC:jk/sp/1621f

3  
Enclosures

cc: Division File - Administrative Record UIC #68  
Central Region  
USEPA -- Rita Bair 5WD-TUB9  
USEPA -- George Hudac 5WD-TUB9 ✓  
ISGS - Ed Mehnert  
ISWS - John Nealon  
Douglas W. Clay  
Gary King  
Barton Day  
Compliance Section  
Department of Mines and Minerals -- Oil and Gas Division  
Bill Radlinski



217/782-6762

UIC Log 68

Hazardous Waste Class I Well  
FINAL

Underground Injection Control Permit: Well No. 1

Refer to: IEPA #1838040027 - Vermilion County  
Danville/Allied-Signal, Inc.  
USEPA #ILD005463344  
Permit #UIC-003-W1-AC  
UIC-Administrative Record

Issued Date: March 30, 1987  
Effective Date: May 4, 1987  
Expiration Date: May 4, 1991

Modification Date: May 5, 1987,  
September 9, 1988  
and April 11, 1989

Allied-Signal, Inc.  
ATTN: Don M. Phillips, Plant Mgr.  
Post Office Box 13  
Danville, Illinois 61834-0013

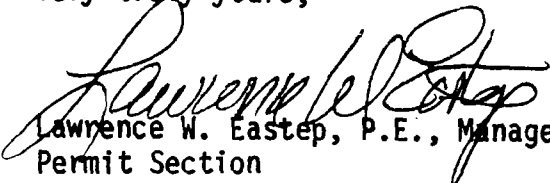
Allied-Signal, Inc.  
ATTN: James Cooper  
Post Office Box 2332R  
Morristown, New Jersey 07960

A permit is hereby granted pursuant to the Illinois Environmental Protection Act and Title 35 Illinois Administrative Code (I.A.C.) Parts 702, 704, 705, and 730 to the Allied-Signal, Inc. to maintain and operate an Underground Injection Control Well No. 1 for the injection of hazardous waste consisting of a maximum of 125 gallons per minute (gpm) of contaminated stormwater, hydrochloric acid vent scrubber discharge, boiler blowdowns, cooling tower blowdowns, dilute waste caustic from a scrubber, hydrofluoric acid vent scrubber discharge, water softening equipment backflush, and by-product hydrochloric acid into the Emmence, Postosi, and Upper Franconia Formations. All wastes are neutralized prior to injection. The Allied-Signal, Inc. well is located at 446.19 feet north and 46.88 feet west of the SE corner of the SW quarter of the NW quarter of Section 12, Township 19 North, Range 11 West of the 2nd Principal Meridian, Vermilion County, Illinois.

This permit consists of the conditions contained herein (including those in any attachments and appendices) and applicable regulations contained in the Illinois Environmental Protection Act and Title 35 I.A.C. Parts 702, 704, 705, and 730. The Environmental Protection Act (Ill. Rev. Stat., Chapter 111 1/2, Section 1039) grants the Illinois Environmental Protection Agency the authority to impose conditions on permits which it issues. This Permit contains 37 pages including Attachments A through H.

If you have any questions regarding this final permit, please contact Douglas W. Clay at 217/782-6762.

Very truly yours,

  
Lawrence W. Eastep, P.E., Manager  
Permit Section  
Division of Land Pollution Control

LWE:SG:jas/1042j,1/sp



TABLE OF CONTENTS

	<u>Page No.</u>
I. PERMIT CONDITIONS	
A. WELL SPECIFICATION .....	1
1. Well Location .....	1
2. Application and Plans .....	1
3. Casing and Cementing .....	1
4. Tubing Specifications .....	2
5. Conductivity Rings .....	2
6. Access During Logging and Testing .....	2
7. Blowout Preventer .....	2
B. OPERATING, MONITORING, AND REPORTING REQUIREMENTS .....	2
1. Operating Requirements .....	2
2. Monitoring Requirements .....	4
3. Waste Analysis Plan .....	4
4. Groundwater Monitoring Plan .....	5
5. Monthly Reporting Requirements .....	5
C. EFFECT OF PERMIT .....	7
D. PERMIT ACTIONS .....	8
E. SEVERABILITY .....	8
F. CONFIDENTIALITY .....	8
G. PENALTIES FOR VIOLATION OF PERMIT .....	8
H. DUTIES AND REQUIREMENTS .....	9
1. Duty to Comply .....	9
2. Duty to Reapply .....	9
3. Need to Halt or Reduce Activity .....	9
4. Duty to Mitigate .....	9
5. Proper Operation and Maintenance .....	9
6. Property Rights .....	9
7. Duty to Provide Information .....	10
8. Inspection and Entry .....	10
9. Monitoring .....	10
10. Records .....	10
11. Signatory Requirements .....	11
12. Reporting Requirements .....	11
13. Corrective Action Requirements .....	12
14. Twenty-four Hour Reporting .....	12
15. Transfer of Permit .....	13
16. Financial Responsibility .....	13
17. Cost Estimate for Plugging and Abandonment .....	14
18. Incapacity .....	14
19. Revocation of Permits .....	15
20. State Mining Board Permits .....	15
21. False or Omitted Information .....	15



Page No.

22. Restriction on Unpermitted Waste .....	16
23. Plugging and Abandonment .....	16
24. Conversion or Abandonment .....	16
25. Inactive Wells .....	17
26. Mechanical Integrity .....	17
27. Contingency Plan .....	18
28. EP Toxicity .....	18
29. Neutralization .....	19
30. Section 39(n) Approval .....	19
31. Continuing Releases at Permitted Facilities .....	19
32. Restrictions on Future Land Use for Hazardous Facilities .....	19

II. ATTACHMENTS

A. PROCEDURE FOR PLUGGING AND ABANDONMENT OF WASTE DISPOSAL #1 .....	21
B. PROCEDURE USED FOR MECHANICAL INTEGRITY .....	23
C. WELL DIAGRAM .....	27
D. CHEMICAL PARAMETERS FOR MONITORING PROGRAM .....	29
E. PROCEDURE FOR CALCULATING AVERAGE VALUES .....	30
F. PROCEDURE FOR WELL FAILURE OR EQUIPMENT FAILURE .....	31
G. SUMMARY OF SUBMITTAL DATES .....	33
H. GROUNDWATER MONITORING PLAN .....	35

**I. PERMIT CONDITIONS****A. WELL SPECIFICATION**

1. **Well Location.** The injection well WDW-1 shall be operated at 446.19 feet north and 46.88 feet west of the SE corner of the SW quarter of the NW quarter of Section 12, Township 19 North, Range 11 West of the 2nd Principal Meridian, Vermilion County, Illinois. The completed depth of the well is at 3613 feet or 2965 feet below Mean Sea Level.

2. **Application and Plans.** Well operation shall be conducted in accordance with the approved permit application and plans prepared by Allied-Signal Inc. and Ken E. Davis Associates consisting of:

<u>Pages</u>	<u>Date</u>	<u>Date Received</u>
237	June 17, 1985	June 20, 1985
21	October 1985	November 25, 1985
88	May 23, 1986	May 27, 1986
7	June 13, 1986	June 18, 1986
24	September 12, 1986	September 16, 1986
4	December 17, 1986	December 17, 1986
49	December 17, 1986	December 17, 1986
124	January 12, 1987	January 14, 1987
9	March 20, 1987	March 24, 1987
23	March 24, 1987	March 25, 1987
51	May 26, 1987	May 27, 1987
10	April 8, 1988	April 11, 1988
1	November 22, 1988	November 28, 1988
18	January 10, 1989	January 10, 1989
2	February 17, 1989	February 17, 1989

3. **Casing and Cementing.** The injection well, WDW #1, is cased and cemented to prevent the movement of fluids into or between underground sources of drinking water. The casing and cement used in the construction of the well are shown in Attachment C. (35 I.A.C. 730.112(b))

- a. **Surface Casing.** Surface casing is set and cemented to a subsurface depth of 224 feet. Cementing was accomplished with 10.92 cubic yards of regular cement with 3% calcium chloride additive cement. The pump and plug cementing method was used to seal the well bore and fill the annular space between the hole and casing to the surface of the ground.



- b. Intermediate casings. The bottom of the intermediate casing strings are set at 2773 feet and 3600 feet and cemented with pozmix resin cement with 18% salt and 4% gel additives using the pump and plug method. The casing set at 2773 feet casing is cemented to the surface and the casing set at 3600 feet casing is cemented to a depth of 1870 feet below the Kelley bushing and filled with kerosene to the surface as indicated in Attachment C.
    - c. Longstring Casing. Long string casing is set to the top of the disposal zone, at approximately 3613 feet, and cemented with Epseal cement using the pump and plug method.
  - 4. Tubing Specifications. Injection will only be through the 2 7/8 inch OD (outer diameter) fibercast tubing between 0 and approximately 3343 feet and through 2 3/8 inch OD fibercast tubing approximately between 3345 and 3670 feet. Tubing specifications are contained in Attachment C of this permit. Any changes in the tubing material and design shall be submitted to the Permit Section, Division of Land Pollution Control for approval at least 30 days prior to installation. (35 I.A.C. 730.112(b))
  - 5. Conductivity Rings. Except as noted below, two sets of conductivity rings shall be maintained at all times. Sets of conductivity rings shall be set at approximately 3575 feet and the upper set at approximately 3560 feet. A minimum of two wires shall be attached to each conductivity ring so that the permittee can monitor the continuity of the electrode system. If either set of rings fails, the failing set shall be repaired during the next scheduled mechanical integrity test; provided, however, that the well shall not be operated unless one set of rings is in operation.
  - 6. Access During Logging and Testing. The Agency and Illinois State Water and Geological Surveys will be given access to witness the running of any logs or tests. (35 I.A.C. 702.149)
  - 7. Blowout Preventer. A permanent blowout preventer shall be maintained on the wellhead at all times.
- B. OPERATING, MONITORING AND REPORTING REQUIREMENTS
  - 1. Operating Requirements (35 I.A.C. 730.113(a))
    - a. Maximum injection pressure. The maximum injection pressure at the wellhead shall not exceed 100 psig.





- b. Maximum injection rate. The maximum injection rate shall not exceed 125 gpm. Permittee may seek a minor modification to this permit to allow an increase in the maximum injection rate upon installation of an injection rate recorder which ensures that the range exceeds 20% of the maximum injection rate.
- c. Waste Parameters. The injected waste shall not exceed the maximum limits of the parameters indicated below.

<u>Parameters</u>	<u>Haz Waste Code</u>	<u>Range or Maximum Limit</u>
Total Organic Carbon (TOC)		200 mg/l
Arsenic	D004	500 mg/l
pH		5-10*
Specific Gravity		1.2

\*Excursions\*\* from the pH range of 5-10 are permitted subject to the following limitations:

- 1) the total time during which the pH values are outside the required range of pH values shall not exceed 7 hours and 26 minutes in any calendar month and
- 2) no individual excursion from the range of pH values shall exceed 60 minutes.

\*\* For purposes of this permit, an excursion is an unintentional and temporary incident in which the pH value of injected waste water exceeds the range set forward in the permit.

- d. Annulus Protection. The annulus between the tubing and the long string of casings and the annulus between the 9 5/8 inch and 7 inch casing shall be filled with kerosene. A pressure range of 200-255 psig shall be maintained on the inner annulus. A pressure  $65 \pm 15$  psig shall be maintained on the 9 5/8 inch and 7 inch annulus.
- e. Annulus injection prohibition. Injection between the outer most casing, protecting underground sources of drinking water, and the well bore is prohibited.
- f. Prohibition of excessive pressure. Except during stimulation, injection pressure at the wellhead shall not exceed a maximum which shall be calculated so as to assure that pressure in the injection zone during injection does not cause:



- i. initiation of new fractures or propagate existing fractures in the injection zone,
    - ii. initiation of fractures in the confining zone,
    - iii. migration of injected fluids into any underground source of drinking water,
    - iv. displacement of formation fluid into any underground source of drinking water, or
    - v. non-compliance with 35 I.A.C. 730 operating requirements.
  - g. Filtration. All waste that is injected into the well shall be filtered through a 100 micron or smaller particle filter.
2. Monitoring Requirements (35 I.A.C. 730.113(b))
- a. Sampling. The injection waste shall be sampled and monitored at the wellhead and shall be analyzed at the frequency specified in Attachment D. The pH and temperature shall be measured at the time the sample for specific gravity is taken and used when the sample is analyzed.
  - b. Continuous recording devices. The following continuous recording devices or their equivalents are used to monitor the injection pressure, flow rate, pH, temperature, and annulus pressure:
    - i. Injection pressure gauges - Foxboro Model 40 recorder.
    - ii. Casing-tubing annulus pressure gauges - Foxboro Model 40 recorder.
    - iii. Flow meters - Foxboro Model 40 recorder and Foxboro 2803-SABA-DB recorder.
    - iv. pH recording device - Foxboro 40 PR-RFE3F-ESA21AN recorder on a 7 day rotational chart.
    - v. Temperature - Safecare PG-73 nonrecorder.
    - vi. Annulus conductivity and cable continuity - Easterline Angus MRL Multipoint Recorder/Logger.
  - c. Recording device ranges. All recording devices, except pH recorders, will exceed maximum operating ranges by 20%.



3. Waste Analysis Plan (35 I.A.C. 704.187)

The Permittee shall develop and follow a written Waste Analysis Plan which describes the procedures which will be carried out to comply with Permit Conditions for sampling in the Monitoring Requirements of Condition B2a. This plan shall be submitted to the Permit Section, Division of Land Pollution Control for approval within forty-five (45) days after the date of this modified permit is in effect. A copy of the plan shall be kept at the facility. At a minimum, the plan must specify:

- a. The parameters for which each hazardous waste will be analyzed and the rationale for the selection of these parameters;
- b. The test methods which will be used to test for these parameters; and
- c. The sampling method which will be used to obtain a representative sample of the waste to be analyzed and the frequency of sampling and analysis for each parameter.
- d. Sample preservation. Organic sampling and analytical procedures consistent with the "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods" (SW-846) shall be incorporated in the waste analysis plan.
- e. Sampling methods for monitoring wells will also be addressed in the Waste Analysis Plan.

4. Groundwater Monitoring Plan. The Permittee shall submit a Groundwater Monitoring Plan to the Permit Section, Division of Land Pollution Control no later than forty-five (45) days after the date of this modified permit is in effect. This plan will be designed to detect any migration of fluids into and pressure build-up in the Underground Sources of Drinking Water (USDWs) and/or aquifers containing less than 10,000 mg/l of total dissolved solids (TDS). This plan should also include the parameters to be measured and the frequency of monitoring. The elements of an acceptable Groundwater Monitoring Plan are set forth in Attachment H. The time for submission may be extended for good cause if the Agency receives a request before the expiration of the forty-five (45) day period and said request demonstrates the need for an extension. The Permittee may request waiver of this requirement within forty-five (45) days of the effective date of this modified permit if it can be demonstrated that there is no potential for fluid movement above the confining zone caused by injection activity or that USDWs are completely absent within the area of review. Upon approval



of the Groundwater Monitoring Plan, or waiver of the ground water monitoring requirements, the plan or waiver will be incorporated into this permit as Attachment H. All extensions or waivers granted must be in writing. (35 I.A.C. 730.113)

5. Monthly Reporting Requirements

- a. Report submittal date. Monthly monitoring reports are due by the 28th day of the month immediately following the reporting period. A reporting period is defined as a calendar month.
- b. Contents of monthly reports. The monthly reports shall include:
  - i. Daily value for total volume and daily maximum, minimum, and average values for annulus pressure, injection pressure, and flow rate, using the procedure in Attachment E.
  - ii. The number of start ups during each day.
  - iii. Total gallons injected to date.
  - iv. Monthly summary of:
    - (a) maximum, minimum, and average values for annulus pressure, injection pressures and flow rate using the procedure in Attachment E.
    - (b) total volume.
    - (c) total number of well startups.
  - v. Operating charts for the month submitted on 7 day circular charts for:
    - (a) annulus pressure
    - (b) injection pressure
    - (c) flow rate
  - vi. Results of chemical analyses required by this permit.
  - vii. A copy of the annulus conductivity and cable continuity recording charts.



- c. Other information in monthly reports. The results of any of the following tests or work shall be reported with the second monthly report after completion of the test or work:
  - i. Periodic tests of mechanical integrity.
  - ii. Copies of any logs run on the well submitted with a log analysis.
  - iii. Any other test conducted on the injection well.
  - iv. Any well work over.
  - v. Maintenance performed on monitoring devices or well components.
  - vi. Changes of gauges, pipes, and other well components and monitoring devices.
- d. Illegible reports will be returned to the Permittee and deemed not filed. All graphs and charts will be labeled appropriately.
- e. Report submittal addresses.

One copy of the monthly reports will be submitted to each of the following addresses:

- i. Illinois Environmental Protection Agency  
Division of Land Pollution Control - #24  
Compliance Section  
2200 Churchill Road  
P.O. Box 19276  
Springfield, Illinois 62794-9276
- ii. Illinois Environmental Protection Agency  
Division of Land Pollution Control  
Field Operations Section  
4500 South 6th Street  
Springfield, Illinois 62706
- iii. Illinois State Geological Survey  
Groundwater Section (Deep Well Disposal)  
Attention: Mr. Ed Mehnert  
615 East Peabody Drive  
Champaign, Illinois 61820
- iv. Illinois State Water Survey  
Ground Water Section (Deep Well Disposal)  
Attention: Mr. John Nealon  
2204 Griffith Drive  
Champaign, Illinois 61820



- C. **EFFECT OF PERMIT.** The existence of a UIC permit shall not constitute a defense to a violation of the Environmental Protection Act, or Subtitle G except for development, modification, or operation without a permit. A permit may be modified or revoked during its term for cause set forth in 35 I.A.C. 702.183 through 701.186. (35 I.A.C. 702.181)

The Permittee is allowed to engage in underground injection in accordance with the conditions of this permit. The underground injection activity, authorized by this permit shall not allow the movement of fluid containing any contaminant into underground sources of drinking water, if the presence of that contaminant may cause a violation of any primary drinking water regulation under 40 CFR Part 142 or may otherwise adversely affect the health of persons or the environment. Any underground injection activity not authorized in this permit is prohibited. (35 I.A.C. 704.122)

Compliance with the terms of this permit does not constitute a defense to any action brought under Section 1431 of the Safe Drinking Water Act (SDWA) or any other law governing protection of public health or the environment for any imminent and substantial endangerment to human health, or the environment. In the case of disagreement between the conditions of this permit and the application, the permit conditions shall govern.

- D. **PERMIT ACTIONS.** This permit may be modified or revoked for cause as specified in 35 I.A.C. 702.183 through 702.187. The filing of a request by the Permittee for a permit modification or revocation, or a notification of planned changes or anticipated noncompliance, does not stay the applicability or enforceability of any permit condition. (35 I.A.C. 702.146)
- E. **SEVERABILITY.** The provisions of this permit are severable, and if any provision of this permit, or the application of any provision of this permit is held invalid, the application of such provision to other circumstances, and to the remaining provisions of this permit shall not be affected thereby. (35 I.A.C. 700.107)
- F. **CONFIDENTIALITY.** In accordance with Section 7 of the Environmental Protection Act, certain information submitted to the Agency pursuant to this permit may be claimed as confidential by the submitter. Any such claim must be asserted at the time of submission by stamping the words "confidential business information" on each page containing such information. If no claim is made at the time of submission, Agency may make the information available to the public without further notice. If a claim is asserted, the validity of the claim will be assessed in accordance with the Board and Agency procedures. Claims of confidentiality for the following information will be denied:



1. The name and address of the Permittee;
  2. Information which deals with the existence, absence or level of contaminants in drinking water.
- G. PENALTIES FOR VIOLATIONS OF PERMIT CONDITIONS. Any person who violates a permit requirement is subject to civil penalties, fines, and other enforcement action under SDWA and the Environmental Protection Act.
- H. DUTIES AND REQUIREMENTS
1. Duty to Comply. The Permittee shall comply with all applicable Underground Injection Control (UIC) program regulations and conditions of this permit, except to the extent and for the duration such noncompliance is authorized by a temporary emergency permit under 35 I.A.C. 704.163. Any permit noncompliance constitutes a violation of the Illinois Environmental Protection Act and is grounds for enforcement action, permit revocation, modification, or denial of a permit renewal application. Such noncompliance may also be grounds for enforcement action under the Resource Conservation and Recovery Act (RCRA). (35 I.A.C. 702.141 and 35 I.A.C. 704.181(a))
  2. Duty to Reapply. If the Permittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the Permittee must submit an application for a new permit at least 180 days before this permit expires. (35 I.A.C. 702.142)
  3. Need to Halt or Reduce Activity. It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit. (35 I.A.C. 702.143)
  4. Duty to Mitigate. The Permittee shall take all reasonable steps to minimize or correct any adverse impact on the environment resulting from non-compliance with this permit. (35 I.A.C. 702.144)
  5. Proper Operation and Maintenance. The Permittee shall at all times properly operate and maintain all facilities, systems of treatment, and controls (and related appurtenances) which are installed or used by the Permittee to achieve compliance with the conditions of this permit. Proper operation and maintenance includes effective performance, adequate funding, adequate operator staffing and training, adequate laboratory and process controls, and appropriate quality assurance procedures. This



provision requires the operation of backups, auxiliary facilities, or similar systems used only when necessary to achieve compliance with the condition of the permit. (35 I.A.C. 702.145)

6. Property Rights. Issuance of this permit does not convey any property rights of any sort, or any exclusive privilege. (35 I.A.C. 702.147)
7. Duty to Provide Information. The Permittee shall furnish to the Agency, within the specified times, any information which the Agency may request, to determine whether cause exists for modifying, revoking and reissuing, terminating this permit, or to determine compliance with this permit. The Permittee shall also furnish to the Agency, upon request, copies of records required to be kept by this permit. (35 I.A.C. 702.148)
8. Inspection and Entry. The Permittee shall allow an authorized representative of the Agency, upon the presentation of credentials and other documents as may be required by law, and at reasonable times to:
  - a. Enter upon the Permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit;
  - b. Have access to and copy any records that must be kept under the conditions of this permit;
  - c. Inspect any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; and
  - d. Sample or monitor for the purposes of assuring permit compliance or as otherwise authorized by the appropriate Act, any substances or parameters at any location. (35 I.A.C. 702.149)
9. Monitoring. Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity. (35 I.A.C. 702.150(a))
10. Records. (35 I.A.C. 702.150(b), (c) and 704.181(b))
  - a. The Permittee shall retain records of all monitoring information, including all calibration, maintenance records, original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete





the application for this permit, for a period of at least 3 years from the date of the sample, measurement, report, or application. This period may be extended by request of the Agency at any time.

- b. Retention of records. The Permittee shall retain records concerning the nature and composition of all injected fluids until three years after the completion of any plugging and abandonment procedures specified under 35 I.A.C. 704.188. The Owner or Operator shall continue to retain the records after the three year retention period unless the owner or operator delivers the records to the Agency or obtains written approval from the Agency to discard the records.
  - c. Records of monitoring information shall include:
    - i. The date, exact place, and time of sampling or measurements;
    - ii. The individual(s) who performed the sampling or measurements;
    - iii. A precise description sampling methodology and handling;
    - iv. The date(s) analyses were performed;
    - v. The individual(s) who performed the analyses;
    - vi. The analytical techniques or methods used; and
    - vii. The results of such analyses.
11. Signatory Requirements. All reports, or information submitted to the Agency shall be signed and certified as required in 35 I.A.C. 702.126. (35 I.A.C. 702.151)
12. Reporting Requirements.
- a. Planned changes. The Permittee shall give written notice to the Agency within 15 days of any planned physical alterations or additions to the permitted facility. (35 I.A.C. 702.152(a))
  - b. Anticipated noncompliance. The Permittee shall give advance notice to the Compliance Section, Division of Land Pollution Control of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements. (35 I.A.C. 702.152(b)).



- c. Other noncompliance. The Permittee shall report all instances of noncompliance not reported under 35 I.A.C. 702.152 paragraphs (d), (e) and (f) at the time monitoring reports are submitted. The reports shall contain the information referenced in 35 I.A.C. 702.152 subsection (f). (35 I.A.C. 702.152(g))
- d. A summary of the reporting dates can be found in Attachment G for all information required by this permit.

13. Corrective Action Requirements

- a. The permitted well will be immediately shut-in and the Compliance Section, Division of Land Pollution Control will be notified if:
  - i. upward fluid migration occurs through the well bore of any unknown, improperly, or unplugged well(s) due to injection of permitted fluid and/or.
  - ii. any problems developed with the casing of the injection well.
- b. The improperly plugged or unplugged well(s) will then be plugged and abandoned immediately. A copy of the plugging affidavit(s) filed with the Oil and Gas Division, Illinois Department of Mines and Minerals must be submitted to the Compliance Monitoring Section, Division of Land Pollution Control.
- c. Telephone notification within twenty-four (24) hours of the discovery of the problem and written confirmation transmitted by letter within five (5) days.
- d. In case of well failure the procedures in Attachment F will be followed. An investigation of the indicated well failure and plan of action to eliminate the problem must be conducted and the remedial work performed.

14. Twenty-four Hour Reporting.

- a. The Permittee shall report to the Compliance Section, Division of Land Pollution Control any noncompliance which may endanger health or the environment. Any information shall be provided orally within 24 hours from the time the Permittee becomes aware of the circumstances.



- b. A written submission shall also be provided to the Compliance Section, Division of Land Pollution Control within 5 days of the time the Permittee becomes aware of the circumstances. The written submission shall contain:
  - i. a description of the noncompliance and its cause;
  - ii. the period of noncompliance, including exact dates and times;
  - iii. if the noncompliance has not been corrected, the anticipated time it is expected to continue; and
  - iv. steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance. (35 I.A.C. 702.152(f))
- c. The following shall be included as information which must be reported within 24 hours (35 I.A.C. 704.181(d)):
  - i. Any monitoring or other information which indicates any contaminant may cause an endangerment to underground sources of drinking water.
  - ii. Any noncompliance with a permit condition or malfunction of the injection system which may cause fluid migration into or between underground sources of drinking water.

15. Transfer of Permit.

- a. Transfers. This permit is not transferable to any person except after notice to the Permit Section, Division of Land Pollution Control. The Agency may require modification of the permit to change the name of the Permittee and incorporate such other requirements as may be necessary under the appropriate Act. (35 I.A.C. 702.152(c))
- b. Transfer by modification. A permit may be transferred by the Permittee to a new owner or operator only if the permit has been modified (under 702.183 through 185), reissued, or a minor modification made (under Section 702.187(d)), to identify the new permittee and incorporate such other requirements as may be necessary under the appropriate Act. The new owner or operator to whom the permit is transferred shall comply with all the terms and conditions specified in such permit. (35 I.A.C. 702.182(a))

16. Financial Responsibility. (35 I.A.C. 704.189) The Permittee will maintain financial responsibility and resources to close,



plug, and abandon the underground injection wells in a manner prescribed by the Agency, and described in Attachment A.

- a. The Permittee must show evidence of financial responsibility to the Permit Section, Division of Land Pollution Control by the submission of a surety bond, other adequate assurance such as financial statements, or other materials acceptable to the Agency.
- b. The financial documents submitted must be revised and maintained as specified in 35 I.A.C. 704 and 40 CFR 144.

17. Cost Estimates for Plugging and Abandonment. (35 I.A.C. 704.212)

- a. The owner or operator will maintain a written estimate, in current dollars, of the cost of plugging the injection well in accordance with the plugging and abandonment procedure (Attachment A). The cost estimate must equal the cost of plugging and abandonment at the point in the facility's operating life when the extent and manner of its operation would make plugging and abandonment the most expensive, as indicated by its plan.
- b. The owner or operator must adjust the cost estimate for inflation within 30 days after each anniversary of the date on which the first cost estimate was prepared. The adjustment must be made as specified in paragraphs (i) and (ii) of this condition, using an inflation factor derived from the annual Oil and Gas Field Equipment Cost Index. The inflation factor is the result of dividing the latest published annual Index by the Index for the previous year.
  - i. The first adjustment is made by multiplying the cost estimate by the inflation factor. The result is the adjusted cost estimate.
  - ii. Subsequent adjustments are made by multiplying the latest adjusted cost estimate by the latest inflation factor.
- c. The owner or operator must review the cost estimate whenever a change in the plan increases the cost of plugging and abandonment. The revised cost estimate must be adjusted for inflation as specified in paragraph (b).
- d. The owner or operator must keep the following at the facility during the operating life of the facility:
  - i. the latest cost estimate prepared in accordance with paragraphs (a) and (c) and,



- ii. the latest adjusted cost estimate prepared in accordance with paragraph (b). (35 I.A.C. 704.212)

18. Incapacity (35 I.A.C. 704.230)

- a. An owner or operator shall notify the Agency by certified mail of the commencement of a voluntary or involuntary proceeding under 11 U.S.C. (Bankruptcy), naming the owner or operator as debtor, within 10 business days after the commencement of the proceeding. A guarantor of a corporate guarantee as specified in 35 I.A.C. 704.219 must make such a notification if the guarantor is named as debtor, as required under the terms of guarantee in 35 I.A.C. 704.240.
- b. An owner or operator who fulfills the requirements of 35 I.A.C. 704.213 by obtaining a letter of credit, surety bond or insurance policy will be deemed to be without the required financial assurance in the event of bankruptcy, insolvency or a suspension or revocation of the license or charter of the issuing institution. The owner or operator must establish other financial assurance within 60 days after such event.

19. Revocation of Permits. (35 I.A.C. 702.186) The Illinois Pollution Control Board will revoke a permit during its term in accordance with Title VIII of the Illinois Environmental Protection Act or the Agency will deny permit renewal for the following causes:

- a. The Permittee's violation of the Environmental Protection Act or regulations adopted thereunder;
- b. Noncompliance by the Permittee with any condition of the permit;
- c. The Permittee's failure in the application or during the permit issuance process, to disclose fully all relevant facts, or the Permittee's misrepresentation of any relevant facts at any time; or
- d. A determination that the permitted activity endangers human health or the environment and can only be regulated to acceptable levels by permit modification or revocation.

20. State Mining Board Permits. Issuance of this permit does not relieve the Permittee of the responsibility of complying with the provisions of Illinois State Mining Board Rules and Regulations and an Act in Relation to Oil, Gas, Coal, and Other Surface and Underground Resources. (Rule II, Illinois Department of Mines and Minerals Rules and Regulations)



21. False or Omitted Information.

- a. The Permittee shall not make any false statement, representation, or certification in any application, record, report, plan, or other document submitted to the Agency, the United States Environmental Protection Agency (USEPA), or required to be maintained under this permit.
- b. If or when the Permittee becomes aware that they failed to submit any relevant facts in a permit application or incorrect information was submitted in a permit application or in any report to the Agency, the Permittee shall promptly submit such facts or correct information to the Permit Section, Division of Land Pollution Control within ten (10) days. (35 I.A.C. 702.152(h))

22. Restriction on Unpermitted Waste. No waste other than those noted in this permit shall be injected. The Permittee shall submit, on January 15 of each year, a certified statement attesting compliance with this requirement for the previous calendar year. (35 I.A.C. 702.160)

23. Plugging and Abandonment.

- a. The Permittee will plug and abandon the injection well in accordance with the schedule and provisions of the approved plugging and abandonment plan herein incorporated as Attachment A. (35 I.A.C. 702.188)
- b. No later than thirty (30) days after plugging and abandonment the Permittee will submit a report to the Compliance Section, Division of Land Pollution Control. The report shall be certified as accurate by the person who performed the plugging operation, and will consist of:
  - i. A statement that the well was plugged in accordance with the plan most recently submitted to the Agency; or
  - ii. A statement defining the actual plugging and explaining why the Agency should approve such deviation, if the actual plugging differed from the approved plan. Any deviation from a previously approved plan which may endanger underground sources of drinking water is cause for the Agency to require the operator to replug the well; and
  - iii. Copy of well plugging affidavit submitted to Illinois Department of Mines and Minerals.



- c. If the approved plugging and abandonment plan should change, a revised plan shall be submitted to the Permit Section, Division of Land Pollution Control for approval at the time of the next monthly report. Once approved, the revised plugging and abandonment plan will replace Attachment A and become as part of this permit as a minor modification.
- 24. Conversion or Abandonment. The Permittee will notify the Permit Section, Division of Land Pollution Control 45 days prior to conversion or abandonment of the wells. Any modification to the plugging and abandonment or conversion found in Attachment A must be submitted for approval 180 days prior to actual conversion or abandonment. (35 I.A.C. 704.181(e))
- 25. Inactive Wells. (35 I.A.C. 704.188) After cessation of injection for two (2) years the Permittee will plug and abandon the well in accordance with Attachment A of this permit and 35 I.A.C. 730.110 unless the Permittee has:
  - a. Provided notice to the Compliance Section, Division of Land Pollution Control; and
  - b. Described actions or procedures, which are deemed satisfactory by the Agency, to ensure the well will not endanger underground sources of drinking water during the period of temporary abandonment. These actions and procedures shall include compliance with the technical requirements applicable to active injection wells, including mechanical integrity testing, unless waived by the Agency in writing.
- 26. Mechanical Integrity. (35 I.A.C. 704.190)
  - a. A demonstration of mechanical integrity will be conducted to ensure the well has integrity during the life of this permit. A descriptive report interpreting the results will be submitted with log analyses to the Compliance Section, Division of Land Pollution Control by an independent Log Analyst. The procedures specified in Attachment B of this permit will apply unless Allied-Signal Inc., submits and the Agency approves alternative mechanical integrity testing procedures.
  - b. The Permittee will demonstrate the absence of significant leaks in the casing or injection tubing by use of a pressure test and surface tubing pressure test to be conducted annually.



- c. The Permittee will demonstrate the absence of significant fluid movement into an underground source of drinking water through vertical channels adjacent to the injection well bore by use of a temperature log at least once every two years for the casing and an annual radioactive tracer survey run through the tubing.
- d. The Permittee will demonstrate, on a quarterly basis, the integrity of the electrode system.
- e. Additional Mechanical Testing. In addition to a pressure test, temperature log, and radioactive tracer survey, the Permittee will inform the Compliance Section, Division of Land Pollution Control of any additional mechanical integrity test, logs, or inspections at least thirty (30) days prior to the demonstration of mechanical integrity.
- f. A cement bond/evaluation log will be run in the entire length of the long string casing at least once every four years.
- g. A casing inspection log will be run with the cement bond log to determine the thickness and condition of the long string casing.
- h. The Permittee will notify the Compliance and Permit Sections, Division of Land Pollution Control of their intent to demonstrate mechanical integrity at least thirty (30) days prior to a demonstration. The type and exact procedures for each test must be specified in the notice.
- i. The Permittee will cease injection if a loss of mechanical integrity as defined by 35 I.A.C. 730.108, or Attachment B of this permit, becomes evident during operation or at the time of the mechanical integrity demonstration. Operation will not be resumed until the Permittee has complied with the provisions of this permit regarding mechanical integrity demonstration and testing.
- j. Gauge Calibration. All gauges used in mechanical integrity demonstrations and in daily operations will be calibrated according to the procedures traceable to the National Bureau of Standards, initially and at least annually thereafter. A copy of the calibration certificate will be submitted to the Agency on January 15 of each year. In addition, recording devices will be time synchronized at least quarterly.
- k. In addition to the mechanical integrity demonstration required by this permit, the Agency may require the





Permittee to conduct a demonstration of the mechanical integrity of the well when evidence reasonably indicates that the integrity of the well is in question.

27. Contingency Plan. The Permittee will follow the contingency plan outlined in Attachment F. (35 I.A.C. 702.160)
28. EP Toxicity. The permittee will perform an extraction procedure (EP) toxicity in accordance with 35 I.A.C. 721.124 for arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver on a composite waste stream. The laboratory results of the EP toxicity will be submitted within 30 days after the effective date of this modified permit monthly report to the Compliance Section, Division of Land Pollution Control and annually thereafter.
29. Neutralization. The Permittee will operate and maintain a system for neutralization of the plant process wastewater.
30. The Agency has approved the information received to meet Section 39(h) of the Environmental Protection Act on the condition that the permittee continue to research the arsenic contamination. The permittee will submit to the Permit Section, Division of Land Pollution Control by November 1, 1989 a detailed report dealing with the source of arsenic, means of treatability, ways to eliminate arsenic from source material, and other ways to manage the waste to eliminate the arsenic contamination. The permittee should demonstrate the technical feasibility and economical reasonableness of recycling the arsenic for reuse or treatment.
31. Continuing Releases at Permitted Facilities. Issuance of this Underground Injection Control (UIC) permit does not release the permittee from complying with applicable requirements of the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act of 1976, as amended (42 USC., §6901 et seq., commonly known as RCRA), and the 1984 Hazardous and Solid Waste Amendments (HSWA). In particular, Section 3004(u) of HSWA requires owner/operators of hazardous waste treatment, storage and disposal facilities seeking permits to take corrective action for all releases of hazardous waste or hazardous waste constituents from any solid waste management unit (SWMU), which includes the injection well. If at any time, the USEPA should determine that a release of hazardous waste or hazardous waste constituents is taking, or has taken place from the well or the injection zone, corrective action requirements and a schedule for their completion may be imposed by USEPA under Section 3004(u) and 3008(h) HSWA. This permit does not constitute a RCRA permit-by-rule, and, further, does not release



the Permittee from complying with the corrective action requirements for other SWMUs at the same facility, nor any other RCRA and HSWA regulations applicable to units and operations at this facility.

32. Restrictions on Future Land Use for Hazardous Facilities. (35 I.A.C. 724.219 & 220) Within 90 days after final plugging and abandonment, the owner or operator must submit to the Compliance Section, Division of Land Pollution Control, to the County Recorder, and to any local zoning authority a survey plat indicating the location of the disposal well with respect to permanently surveyed bench-marks. The plat must be prepared and certified by a professional land surveyor. In addition, the owner or operator must submit to the Agency, the County Recorder and any local zoning authority a record of the type, location and quantity of hazardous waste placed in the well. For wastes disposed before these regulations were promulgated, the owner or operator must identify the type and quantity of the wastes to the best of their knowledge and in accordance with any record which has been kept. Any changes in the type, location or quantity of hazardous wastes disposed of within the facility which occurred after the survey plat and record of wastes had been filed must be reported to the agencies where original plat and record were filed.

The owner of the property where a disposal well is located must record, in accordance with Illinois law, a notation on the deed to the facility property, or on some other instrument normally examined during a title search, to notify, in perpetuity, a potential purchaser of the property of the following:

- (1) the land has been used to dispose hazardous waste;
- (2) the steel plate and cement plug in the well must never be disturbed or removed;
- (3) the survey plat and record of the type well location, and quantity of hazardous waste has been filed with the Illinois Environmental Protection Agency, the County Recorder, and any local zoning authority.



## Attachment A

## PROCEDURES FOR PLUGGING AND ABANDONMENT OF WASTE DISPOSAL #1

1. Displace the tubing and wellbore with sufficient fresh water to flush all waste out of the tubular goods and near wellbore area. Remove all flow lines, associated equipment and instrumentation from wellhead and immediate area.
2. Move in well service rig, including temporary storage tanks, pump and pipe racks.
3. Kill well with adequately weighted water to place fluid level below the well head and prevent the backflow of waste.
4. Remove wellhead. Fill mud tanks with fresh water.
5. Pull out of hole laying down 2 7/8" and 2 3/8" fiberglass injection tubing. Fibercast tubing does not have sufficient strength to use during plugging and abandonment procedures therefore a steel workstring will be required.
6. Rig up wireline service unit and run appropriate logs (including electrical logs) and tests to determine casing condition and determine if channeling has developed behind the 7" 5 1/2" and 7" 4 1/2" protection casing. Also, if it is technically feasible, determine if the cement plug from 4025 feet to 4154 feet is leaking. Rig down wireline service unit. Correct any problems as required.
7. Make up 4 3/4" drill bit and casing scraper on workstring and trip in hole to top of 4 1/2" Fibercast casing (about 3553'). This step will gauge and prepare the 5 1/2" casing for running a cement retainer. Pull out of hole, lay down bit and scraper.
8. Rig up cementing equipment. Make up 5 1/2" cement retainer assembly and run in hole to top of 4 1/2" Fibercast casing. Set retainer at 3550+. Mix and pump sufficient 50/50 Pozmix cement to fill the open hole section from about 4000' to 3623' (about 103 sacks). The purpose of this cement is to form a base on which to emplace a volume of corrosion resistant cement.
9. Tag bottom of well to ensure that a base has been established.
10. Follow the pozmix cement with epoxy resin cement. Using necessary spacer fluids, displace enough resin cement to form a 80' plug beneath the retainer, then close the retainer valve. Fresh water may be used as displacement fluid.
11. Disengage tubing from retainer and emplace a 50' epoxy cement plug on top of the cement retainer (about 167 gallons of epoxy cement will be required). Pull tubing to about 3320 feet and reverse the hole clean.



Allow cement to set overnight before tagging top of plug to confirm proper set-up. Pressure test plug to 1000 psig.

12. Mix and pump an accelerated Class "A" cement plug from the top of the epoxy cement plug to about 1870 feet (about 161 sacks). Pull workstring to about 1690 feet and reverse the workstring clean. Wait on cement (about 4 hours) and confirm location by tagging.
13. Rig up perforating unit and perforate through 5 1/2" and 7" casing into 7" x 9 5/8" annulus at about 1865'.
14. Displace oil in 7" x 9 5/8" annulus by circulating with water or chemical flush then displace with Class "A" cement from about 1865' to the surface.
15. Fill the 5 1/2" casing with cement to the surface (about 450 sacks).
16. Remove bradenhead, cut casings off at 3' below grade and weld 1/2" plate with 1 inch bleed valve across 13 3/8" surface pipe. Inscribe on plate, in a permanent manner, the following information: (1) operator name, (2) closure date and (3) UIC permit number.
17. Release all equipment and clean up location.
18. Submit closure data to regulatory agency.
19. File a plugging affidavit, in duplicate, on Mining Board form with the Oil and Gas Division of Illinois Department of Mines and Minerals. A copy of this affidavit shall be filed with the Compliance Section, Division of Land Pollution Control within 30 days following plugging and abandonment.



Attachment B

PROCEDURES USED FOR MECHANICAL INTEGRITY

Pressure Test

1. Time permitting, add maximum amount of fresh water to injection stream at least 12 hours prior to well shutdown.
2. Shut off all sources of process waste water and inject a minimum of 1100 gallons of "city" water into well.
3. Shut down deep well and depressurize inner annulus by backflowing annulus kerosene into the surface kerosene tank.
4. Remove well head shed, dismantle surface waste water transfer line.
5. Move in well service rig and pull out injection tubing.
6. Insert a casing plug near the bottom of the 5 1/2" casing.
7. Fill annulus with water and allow to stabilize.
8. Pressurize the casing with water to 500 psig, wait four (4) hours to allow for temperature stabilization, repressurize to 500 psig if necessary, and maintain pressure for 1 hour to determine the integrity of casing.
9. Pressurize the 9 5/8 inch and 7 inch annulus space to 100 psig and maintain pressure for 1 hour to determine the integrity of the annular space.
10. Corrective action will be taken if the pressure change is more than 3 percent for any 30 minute period following the stabilization time.
11. Remove casing plug.
12. If needed, address any well deficiencies as required.
13. Install injection tubing (previously surface pressure tested to 300 psig).
14. Install surface transfer line and well shed, repressurize inner annulus to normal operating pressure (200-255 psig).
15. Partially backflush annulus kerosene to assure proper operation of electrode monitoring system.
16. Repressurize annulus to normal operating pressure and start up well.
17. Verify proper operation of well by visually inspecting surface lines and monitoring the annular fluid conductivity, injection and annulus pressures, electrode wire continuity and injection flow rate.



18. Plot the data gathered (volume versus annulus pressure) and determine volume of fluid loss for pressure loss.
19. The data obtained, including recording charts from the testing, shall be submitted to the Compliance Monitoring Section, Division of Land Pollution Control. The test data must be submitted with the second monthly report submitted to the Agency following the test. A technical evaluation shall accompany all test results.

#### Quarterly Conductivity Test

1. Stop injecting waste acid for at least 12 hours prior to backflowing annulus kerosene.
2. Depressurize inner annulus by backflowing annulus kerosene into the surface kerosene tank allowing the waste/kerosene interface to move up the annular space.
3. As the interface contacts the electrodes, an increased conductivity of annular fluid should be detected by the monitoring system.
4. The detection of higher conductivity should alert the well operator by:
  - a. direct readout of the conductivity meters
  - b. visual alarm
  - c. audio alarm
  - d. printout of the "alarmed" conductivity on the monitoring system
5. After the above alarm systems have been activated the inner annulus shall be repressurized to the normal operational pressure.
6. Failure to detect higher conductivity constitutes a well failure and appropriate action will be taken.

#### Temperature Log

1. Shut off all sources of process waste water and inject a minimum of 1100 gallons of "city " water into the well.
2. Shut down well and depressurize inner annulus by backflowing annulus kerosene into surface kerosene tank.
3. Remove well shed and dismantle surface waste water transfer line.
4. Move in well service rig and pull out injection tubing while adding a small amount of water into the casing to displace the volume of injection tubing removed.
5. Wait 48 hours after completing step 1 (above) to initiate temperature log.



6. Run baseline temperature survey from the surface down, for the entire length of the well.

Note: All temperature surveys will be run into the well.

7. Install injection tubing.
8. Repressurize inner annulus to normal operating pressure (200-255 psig).
9. Install surface transfer line and well shed.
10. Partially backflush annulus kerosene to assure proper operation of electrode monitoring system.
11. Repressurize annulus to normal operating pressure and start up the well.
12. Verify proper operation of the well by visually inspecting surface lines and monitoring the annulus fluid conductivity, injection and annulus pressures, electrode wire continuity and injection flow rate.
13. The data obtained, including recording charts from the testing, shall be submitted to the Compliance Section, Division of Land Pollution Control. The test data must be submitted with the second monthly report following the test. A technical evaluation shall accompany all test results.

#### Radioactive Tracer Survey

1. Shut off all sources of process waste water and inject a minimum of 1100 gallons of "city" water into the well.
2. Remove well shed and dismantle surface waste water transfer line.
3. Set up relatively constant injection to 10 to 20 gpm city water.
4. Move in and set up RAT rig and tool.
5. Reposition the tool and eject a small amount of iodine or equivalent into the well and track the tracer in the tubing to verify the absences of tubing leaks.
6. Position the tool at the bottom of the injection tubing and eject another slug of iodine tracer or equivalent into the well.
7. Reposition the tool at the top of the injection zone and wait a period of time that it would take to show the absence of vertical migration.
8. Remove tool, install surface transfer line, and well shed.
9. Verify proper operation of the well by visually inspecting surface lines and monitoring the annulus fluid conductivity, injection and annulus pressures, electrode wire continuity and injection flow rate.

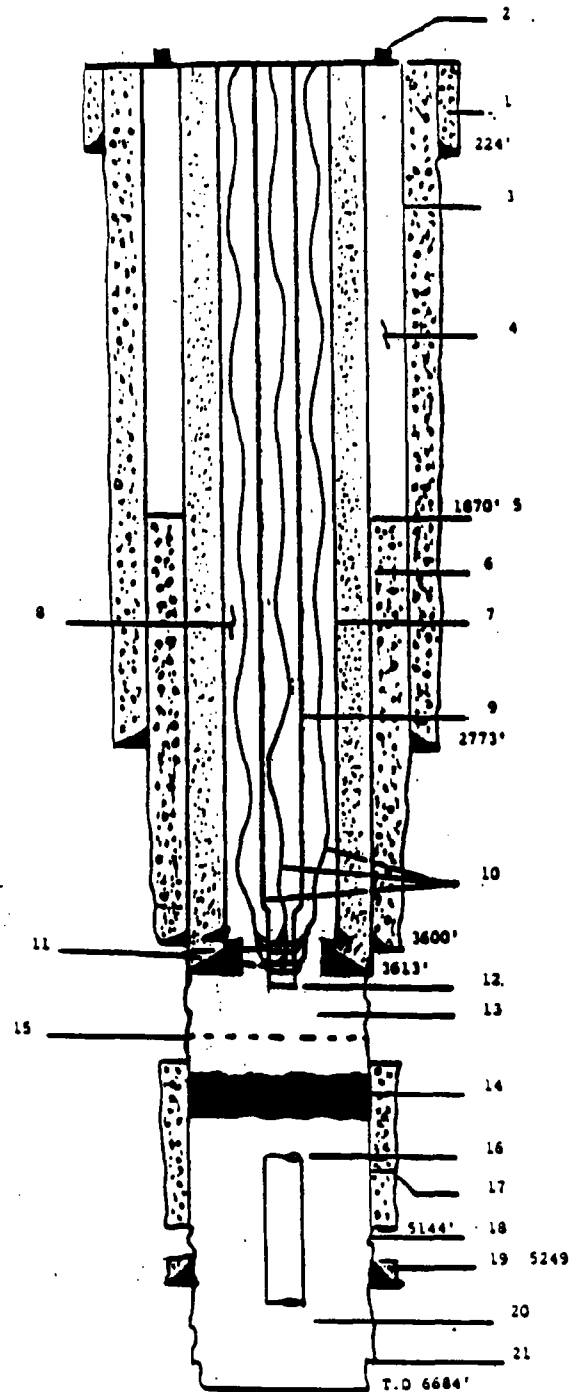


10. The data obtained, including recording charts from the testing, shall be submitted to the Compliance Section, Division of Land Pollution Control. The test data must be submitted with the second monthly report following the test. A technical evaluation shall accompany all test results.





Attachment C  
WELL DIAGRAM



NOTE: All measurements from K.S. 14' above G.L.

1. Surface Casing: 13 1/8", 48 lb/ft. 4-4 casing, set in 17 1/2" hole to 224' (K.S.). Cemented to surface with 350 sx regular cement with 1% CaCl<sub>2</sub>.
2. 3" collar to monitoring vessel.
3. Intermediate Casing: 9 5/8", 36 lb/ft. K-55 casing set in 12 1/4" hole to 1670' (K.S.). Cemented to surface with 350 sx Pozmix with 18% salt and 4% gel.
4. Oil between 9 5/8" and 7" casing to monitoring vessel.
5. Cement top between 9 5/8" and 7" casing at 1670'.
6. Original protection casing is mixed string as follows: 4970' 7" 36 lb/ft. K-55 casing and 174' of 7" Fibercast casing between 4970' and 5144' set in 8 1/4" hole. Cemented to 1670' in 2 stages:  
1st stage, with 350 sx. Pozmix with 18% salt and 4% gel. Plus 300 gal cement.  
2nd stage, with 510 sx. Pozmix with 18% salt and 4% gel.
- During the December, 1973 workover, the 7" casing was milled out from 1600' to 1694'. This included the original DV tool set at 1640'.
7. Inner protection Casing: mixed string as follows: 1551' of 5 1/2", 17 lb/ft. K-55, Hydril Flushjoint casing, Plus 4 1/2" OD 3.7 lb/ft. 1500 psi WP EUE 8 T&C, Fibercast casing, set in 8 1/4" hole to 1613'. Cemented with 2000 gal Special cement and circulated to the surface.
8. Tubing-casing annulus filled with Kerosene to ± 1613'.
9. Injection Tubing, ±3545' of 2 7/8" OD, 2.1 lb/ft. EUE 8RD fiberglass plus 117' of 2 1/8" OD, 1.4 lb/ft. EUE 8RD fiberglass to ±3670'.
10. (3) 4 - Conductor Cables
11. Lead anodes to monitor Kerosene/waste interface are located at 1559', 1562', 1572', and 1575'.
12. Tailpipe 127' of 2 1/8" OD, 1.4 lb/ft. EUE 8RD fiberglass set without a pack to ±3670'.
13. Disposal interval, Eminence and Potosi dolomites completed open hole from 1613' to ±4000' (K.S.).
14. Cement Plug 15 sacks Latex Cement 4025' to 4154'.
15. T.D. found with beller, 1713'.
16. Top of broken off 1 1/2" Fibercast to 4855'.
17. 7" Fibercast Casing from 4970' to 5144' cemented with 100 gal. resin cement. (See No. 6 above).
18. 107' 8 1/4" open hole.
19. 68' of 7" Fibercast Casing broken for casing above (5183' - 5249').
20. 8 1/4" open hole from 5144' - 6150'.
21. 7 7/8" open hole from 6150' to 6684'.

ALLIED SIGNAL CORPORATION  
DANVILLE WORKS  
DANVILLE, ILLINOIS

FIGURE 1  
SCHEMATIC OF CONSTRUCTION DET  
WOW NO. 1

DWG: 450-1 REV  
DATE: 6-25-86 DRAWN BY  
CHECKED BY



Attachment D

CHEMICAL PARAMETERS FOR MONITORING PROGRAM

<u>Parameter</u>	<u>Analytical Frequency*</u>
Total Acidity	W**
Chloride (mg/l)	W
Fluoride (mg/l)	W
Potassium (mg/l)	W
Free Chlorine (mg/l)	W
Specific Gravity	W
Nickel (mg/l)	W
Arsenic (mg/l)	W
Suspended Solids (mg/l)	W
Viscosity (Centipoise)	M
Phenolics, total recoverable (ug/l)	M
Total Organic Carbons (TOC)	W
Total Organic Halogen (TOX)	M
Organic scan (ppb) (unfiltered)	Q
pH (Units)	C
Temperature (°F)	C
Total Dissolved Solids (mg/l)	W

\*M = Monthly

W = Weekly

Q = Quarterly

C = Continuous

\*\* Monitoring of total acidity may be waived by the Agency as a minor modification upon demonstration by the Permittee that the neutralization system is operating in a stabilized and satisfactory manner.



Attachment E

PROCEDURES FOR CALCULATING AVERAGE VALUES

$$\text{Daily Average Flow Rate} = \frac{\text{gallons of wastewater injected (gal/day)}}{\text{(gal/min)} \quad \text{total injection time (hrs/day)} \times (60 \text{ min./hr})}$$

$$\text{Monthly Average Flow Rate} = \frac{\text{gallons of wastewater injected (gal/month)}}{\text{total injection time (hrs/month)} \times (60 \text{ min./hr})}$$

$$\text{Daily Average Pressure} = \frac{\text{sum of pressures recorded/day (psig)}}{\text{\# of readings taken/day}}$$

$$\text{Monthly Average Pressure} = \frac{\text{sum of pressures recorded/month (psig)}}{\text{\# of readings taken/month}}$$

All readings to be taken every two (2) hours, except when the annulus is depressurized for mechanical integrity demonstration.



Attachment F

CONTINGENCY PLAN FOR WELL OR EQUIPMENT FAILURE

The injection well has the following alarms which are designed to alert the operator of potential well failures:

Annular Fluid Hi Conductivity. This alarm is activated when the conductivity of the annular fluid in the area surrounding the electrode rings increases beyond the alarm setting of 4,000 micromhos/centimeter.

Electrode Wire Continuity Break. This alarm signals the operator when a failure exists in the electrode wiring.

Well Head Rupture Disk Alarm. This alarm signals the operator when the 90# rupture disk, which is located on the transfer/injection line immediately above the well head, has ruptured.

In addition to the above alarms the following monitoring devices are used to monitor for proper well operation:

Annulus Pressure Gauge  
Injection Flow Rate Meter  
Temperature Gauge  
Annulus Pressure Recorder  
Flow Rate Recorder  
Conductivity/Continuity Recorder  
Flow Totalizer  
pH recording device

Any circumstances that reasonably indicate a potential for well failure require immediate action of the operator including

- 1) Shut off flow to the well.
- 2) Flush tubing with fresh water and inject annulus oil into the annulus to displace the corrosive waste that has entered the tubing or casing.
- 3) Identify and repair the exact failure.

Any indication of a possible well failure requires immediate notification of a plant supervisor. In the event of a surface failure such as a transfer line leak, the well will be shut down and repaired prior to any well start-up.

In addition to actual mechanical well failures, the well will be shut down if it cannot be operated within the limits specified in the permit, (those being 100 psig injection pressure, 125 gpm injection rate, and 200-255 psig annulus pressure) unless prior approval is obtained from the Agency.

In the event of a prolonged well failure, the plant will have to be shutdown with the exception of operating a boiler for heating purposes during cold



weather. In this worst case scenario the plant would generate approximately 400 gallons per day of waste water from boiler operation, 25 gallons per day of waste water for scrubber operations and an average of 3800 gallons per day of collected rainfall. Given an "on-hand" storage capacity of approximately 460,000 gallons, this plant could operate in this mode for 109 days. If for any reason the deep well would not be expected to be made operational during this period, the boiler would be shut down, acid storage would be emptied (negating the need for scrubbers) and rainwater diverted such that it would not collect in the process sewers. These actions would totally eliminate all sources of the deep well effluent.

Any intentions of storing hazardous waste water in tanks for greater than 90 days will require the tanks to go through closure according to 35 I.A.C. 722.134. A closure plan will have to be submitted on the storage tanks, according to 35 I.A.C. 722.134.



## Attachment G

## SUMMARY OF SUBMITTAL DATES

The following is a summary of submittal dates for data required by this permit. The referenced condition must be consulted for complete details.

<u>Condition</u>	<u>Submittal</u>	<u>Date Due</u>
A 4	Changes in Tubing Specifications	30 days prior to installation
B 3	Waste Analysis Plan	45 days after the date of this modified permit is in effect
B 4	Groundwater Monitoring Plan	45 days after the date of this modified permit is in effect or a later date established pursuant to an extension
B 5	Monthly Operation Reports	28th day of each month
H 2	Duty to reapply	180 days prior to expiration
H 12(a)	Planned changes	15 days prior to planned changes
H 13	Corrective Action Requirements by telephone	24 hours after the discovery
	by letter	5 days after the discovery
H 14	Endangerment of Environment	within 24 hours of the time of endangerment
H 17(b)	Plugging and Abandonment Cost Estimates for Inflation	30 days after each anniversary
H 18(a)	Bankruptcy	10 days after commencement of the proceeding
H 18 (b)	Alternative Financial Responsibility	60 days after such event



<u>Condition</u>	<u>Submittal</u>	<u>Date Due</u>
H 21(b)	Correction of False or Omitted Information	10 days after the discovery
H 22	Restriction on Unpermitted Waste	Jan. 15th of each year
H 23(b)	Certification of Plugging and Abandonment	30 days after plugging
H 24	Plans for Conversion or Abandonment	180 days prior to actual conversion or abandonment
H 24	Notify before Conversion or Abandonment	45 days prior to conversion or abandonment
H 26(e)	Additional Mechanical Integrity Testing	30 days prior to demonstration
H 26(g)	Intent to demonstrate mechanical integrity	30 days prior to demonstration
H 26(i)	Gauge calibration	Jan. 15 of each year
H 28	EP Toxicity	30 days after the effective date of this modified permit and annually thereafter
H 30	Section 39(h) detailed report	November 1, 1989
H 32	Survey plat indicating location of disposal well	90 days after plugging and abandonment
Attachment H	Annual Monitoring Summary	March 1 of each year





Attachment H

GROUNDWATER MONITORING PLAN

The permittee will submit a plan for monitoring the groundwater quality and formation fluid pressure of the first permeable zone immediately overlying the confining layer above the injection zone in accordance with 35 I.A.C. 730.113(B)(4). This plan must be submitted to the Permit Section, Division of Land Pollution Control for approval no later than forty-five (45) days after the date of this modified permit is in effect. A schedule for implementation must be included with the plan.

The plan must include:

- A. A comprehensive report describing the local hydrogeologic framework in which the injection well operates. The report should include:
  1. An interpretation of formation-specific geologic information relating to: a) the adequacy of the confining layer or system; b) the locations and physical characteristics of overlying permeable zones including all underground sources of drinking water (USDWs); and c) an evaluation of faulting, fracturing and jointing. Specific information should be based on historical and current operating records, research of available geologic literature and/or logs from nearby wells. An evaluation should be made of the reliability of the above information and any data gaps identified. Where adequate information does not exist, it must be supplied by actual measurements;
  2. A detailed report on the existence of unplugged, abandoned holes which penetrate the confining layer above the injection zone within a minimum of a 5 mile wide area of review. The report should assess the level of reliability and completeness of existing data on abandoned wells. Where historical records are insufficient, magnetometer surveys or field reconnaissance may be necessary;
  3. Identification of the proposed monitoring zone and a complete description of methods which will be used to determine aquifer parameters such as permeability, transmissivity and storage coefficient;
  4. An evaluation of the vulnerability to contamination of the lowest USDW; and,
  5. A computation of the zone of endangering influence as per 35 I.A.C. 730.106 and a calculation of anticipated pressure build-up in the injection zone over the life of the facility. Data used in these calculations should be supplied by actual measurements.



- B. A monitoring well design and operating plan based on the information in the comprehensive report in A of this attachment. The monitoring well design plan shall include:
1. The number and location of wells designed to: a) detect any leakage of injected fluids above the confining zone; and b) monitor pressure changes by continuous water level recording. A minimum of three (3) wells is recommended to define hydraulic gradient. Monitoring wells should be located as close as physically possible to the injection well.
  2. Well specifications, including:
    - a) drilling and development methods;
    - b) construction details;
    - c) quality assurance plan;
    - d) safety plan;
    - e) proposed mechanical integrity determination;
    - f) step drawdown test to determine well efficiency; and
    - g) television survey (optional).
  3. A sampling plan, including:
    - a) proposed data to be collected during drilling;
    - b) proposed monitoring parameters, including background formation fluid parameters, waste indicator "fingerprint" parameters, and pressure;
    - c) sample collection procedures;
    - d) preservation and shipment;
    - e) analytical procedures; and
    - f) chain of custody control;
  4. Reporting proposal, including:
    - a) initial background survey of formation pressure and water chemistry for the monitoring zone;
    - b) monthly and quarterly submittal of required data; and



c) annual interpretive summary report

Waiver Demonstration

An exemption from groundwater monitoring requirements may be granted if the applicant can conclusively demonstrate that there is no potential for fluid movement above the confining zone caused by the injection activity, or the USDWs are completely absent within the area of review. Examples of acceptable exemption criteria include:

- . The demonstrated absence of complex geologic structures such as faults; and
- . Accurate and detailed records confirm that no unplugged and abandoned or improperly plugged wells exist within the area of review; and
- . A sufficiently thick confining formation (e.g. 500 feet of clay or shale); and
- . The potentiometric surface of the injection zone will not exceed that of the lowest USDW at any time during the operating life of the facility.

Where the above criteria cannot be adequately demonstrated using existing data, direct measurement of vertical permeability of the confining system may be required.

JW:SG:jk/sp/1621f,1-47



217/782-6761

Refer to: 1838040027-Vermilion County  
Danville/Allied-Signal, Inc. Well #1  
ILD005463344  
Permit #UIC-003-W1-AC  
UIC Administrative Record

RECEIVED

DEC 02 1989

U. S. EPA, REGION V  
SWB — PMS

November 30, 1988

Allied-Signal, Inc.  
ATTN: Don Phillips, Plant Manager  
P.O. Box 13  
Danville, IL 61834-0013

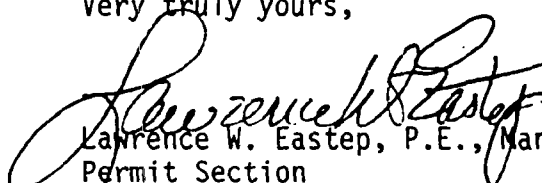
Gentlemen:

This is in response to your letter dated November 7, 1988 requesting a six (6) month extension to submit the Groundwater Monitoring Plan in accordance with Permit #UIC-003-W1-AC.

An extension is hereby granted until May 7, 1989 to submit your Groundwater Monitoring Plan.

If you have any question please contact Douglas W. Clay at 217/782-6762.

Very truly yours,

  
Lawrence W. Eastep, P.E., Manager  
Permit Section  
Division of Land Pollution Control

LWE:DWC:dh/1

cc: Division File-Administrative Records UIC #68  
Springfield Region  
Lynn Crivello, USEPA, Region V-5WD-TUB9  
George Hudach, USEPA, Region V-5WD-TUB9 ✓  
Ed Mehnert, ISGS  
John Nealon, ISWS  
Bill Radlinski  
Compliance Section  
Department of Mines and Minerals, Oil and Gas Division  
Barton Day  
Gary King  
Douglas W. Clay

45

DC



Illinois Environmental Protection Agency · P.O. Box 19276, Springfield, IL 62794-9276

217/782-6762

UIC Log 68

Refer to: 1838040027 -- Vermilion County  
Danville/Allied-Signal, Inc. Well #1  
ILD005463344  
Permit # UIC-003-W1-AC  
UIC Administrative Record

October 3, , 1988

Allied-Signal, Inc.  
Attn: Don Phillips, Plant Manager  
P.O. Box 13  
Danville, IL 61834-0013

Allied-Signal, Inc.  
Attn: James Cooper  
P.O. Box 2332R  
Morristown, NJ 07960

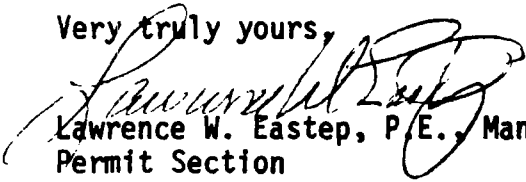
Dear Gentlemen:

Enclosed is a corrected copy of the final permit which was issued to Allied-Signal, Inc. on March 30, 1987. The following pages were corrected and incorporated into the permit as a minor modification.

<u>Page</u>	<u>Condition</u>	<u>Changes</u>
31	Attachment F	0.6 micromhos/centimeter to 4,000. micromhos/centimeter
33	Attachment G B.3 and B.4.	30 days to 45 days

If you have any questions concerning this change, please contact Steve Gobelman at 217/785-0231.

Very truly yours,

  
Lawrence W. Eastep, P.E., Manager  
Permit Section  
Division of Land Pollution Control

LWE:SG:tk:5/8/26

Enclosures

cc: Division File - Administrative Records UIC #68  
Central Region  
Lynn Crivello, USEPA, Region V - 5WD-TUB 9  
George Hudak, USEPA, Region V - 5WD-TUB 9  
Ross Brower, ISGS  
Adrian Visocky, ISWS  
Bill Radlinski  
Compliance Section  
Department of Mines and Minerals, Oil and Gas Division  
Steve Gobelman  
Barton Day  
Doug Clay  
Gary King

43



217/782-6762

UIC Log 68

Hazardous Waste Class I Well

FINAL

Underground Injection Control Permit: Well No. 1

Refer to: IEPA #1838040027 - Vermilion County  
Danville/Allied-Signal, Inc.  
USEPA #ILD005463344  
Permit #UIC-003-W1-AC  
UIC-Administrative Record

Issued Date: March 30, 1987  
Effective Date: May 4, 1987  
Expiration Date: May 4, 1991  
Modification Date: May 5, 1987,  
September 9, 1988, and  
October 3, 1988

Allied-Signal, Inc.  
ATTN: Don M. Phillips, Plant Mgr.  
Post Office Box 13  
Danville, Illinois 61834-0013

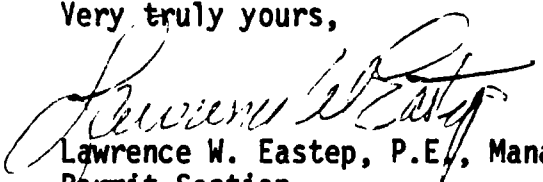
Allied-Signal, Inc.  
Post Office Box 1139R  
Morristown, New Jersey 07960

A permit is hereby granted pursuant to the Illinois Environmental Protection Act and Title 35 Illinois Administrative Code (I.A.C.) Parts 702, 704, 705, and 730 to the Allied-Signal, Inc. to maintain and operate an Underground Injection Control Well No. 1 for the injection of hazardous waste consisting of a maximum of 125 gallons per minute (gpm) of contaminated stormwater, hydrochloric acid vent scrubber discharge, boiler blowdowns, cooling tower blowdowns, dilute waste caustic from a scrubber, hydrofluoric acid vent scrubber discharge, water softening equipment backflush, and by-product hydrochloric acid into the Emmence, Postosi, and Upper Franconia Formations. All wastes are neutralized prior to injection. The Allied-Signal, Inc. well is located at 446.19 feet north and 46.88 feet west of the SE corner of the SW quarter of the NW quarter of Section 12, Township 19 North, Range 11 West of the 2nd Principal Meridian, Vermilion County, Illinois.

This permit consists of the conditions contained herein (including those in any attachments and appendices) and applicable regulations contained in the Illinois Environmental Protection Act and Title 35 I.A.C. Parts 702, 704, 705, and 730. The Environmental Protection Act (Ill. Rev. Stat., Chapter 111 1/2, Section 1039) grants the Illinois Environmental Protection Agency the authority to impose conditions on permits which it issues. This Permit contains 37 pages including Attachments A through H.

If you have any questions regarding this final permit, please contact Steve Gobelman at 217/785-6762.

Very truly yours,

  
Lawrence W. Eastep, P.E., Manager  
Permit Section  
Division of Land Pollution Control

LWE:SG:jas/1042j,1/sp



TABLE OF CONTENTS

	<u>Page No.</u>
I. PERMIT CONDITIONS	
A. WELL SPECIFICATION .....	1
1. Well Location .....	1
2. Application and Plans .....	1
3. Casing and Cementing .....	1
4. Tubing Specifications .....	2
5. Conductivity Rings .....	2
6. Access During Logging and Testing .....	2
7. Blowout Preventer .....	2
B. OPERATING, MONITORING, AND REPORTING REQUIREMENTS .....	2
1. Operating Requirements .....	2
2. Monitoring Requirements .....	4
3. Waste Analysis Plan .....	4
4. Groundwater Monitoring Plan .....	5
5. Monthly Reporting Requirements .....	5
C. EFFECT OF PERMIT .....	7
D. PERMIT ACTIONS .....	8
E. SEVERABILITY .....	8
F. CONFIDENTIALITY .....	8
G. PENALTIES FOR VIOLATION OF PERMIT .....	8
H. DUTIES AND REQUIREMENTS .....	9
1. Duty to Comply .....	9
2. Duty to Reapply .....	9
3. Need to Halt or Reduce Activity .....	9
4. Duty to Mitigate .....	9
5. Proper Operation and Maintenance .....	9
6. Property Rights .....	9
7. Duty to Provide Information .....	10
8. Inspection and Entry .....	10
9. Monitoring .....	10
10. Records .....	10
11. Signatory Requirements .....	11
12. Reporting Requirements .....	11
13. Corrective Action Requirements .....	12
14. Twenty-four Hour Reporting .....	12
15. Transfer of Permit .....	13
16. Financial Responsibility .....	13
17. Cost Estimate for Plugging and Abandonment .....	14
18. Incapacity .....	14
19. Revocation of Permits .....	15
20. State Mining Board Permits .....	15
21. False or Omitted Information .....	15

Page No.

22. Restriction on Unpermitted Waste .....	16
23. Plugging and Abandonment .....	16
24. Conversion or Abandonment .....	16
25. Inactive Wells .....	17
26. Mechanical Integrity .....	17
27. Contingency Plan .....	18
28. EP Toxicity .....	18
29. Neutralization .....	19
30. Section 39(h) Approval .....	19
31. Continuing Releases at Permitted Facilities .....	19
32. Restrictions on Future Land Use for Hazardous Facilities .....	19

II. ATTACHMENTS

A. PROCEDURE FOR PLUGGING AND ABANDONMENT OF WASTE DISPOSAL #1 .....	21
B. PROCEDURE USED FOR MECHANICAL INTEGRITY .....	23
C. WELL DIAGRAM .....	27
D. CHEMICAL PARAMETERS FOR MONITORING PROGRAM .....	29
E. PROCEDURE FOR CALCULATING AVERAGE VALUES .....	30
F. PROCEDURE FOR WELL FAILURE OR EQUIPMENT FAILURE .....	31
G. SUMMARY OF SUBMITTAL DATES .....	33
H. GROUNDWATER MONITORING PLAN .....	35





I. PERMIT CONDITIONS

A. WELL SPECIFICATION

1. Well Location. The injection well WDW-1 shall be operated at 446.19 feet north and 46.88 feet west of the SE corner of the SW quarter of the NW quarter of Section 12, Township 19 North, Range 11 West of the 2nd Principal Meridian, Vermilion County, Illinois. The completed depth of the well is at 3613 feet or 2965 feet below Mean Sea Level.
2. Application and Plans. Well operation shall be conducted in accordance with the approved permit application and plans prepared by Allied-Signal Inc. and Ken E. Davis Associates consisting of:

<u>Pages</u>	<u>Date</u>	<u>Date Received</u>
237	June 17, 1985	June 20, 1985
21	October 1985	November 25, 1985
88	May 23, 1986	May 27, 1986
7	June 13, 1986	June 18, 1986
24	September 12, 1986	September 16, 1986
4	December 17, 1986	December 17, 1986
49	December 17, 1986	December 17, 1986
124	January 12, 1987	January 14, 1987
9	March 20, 1987	March 24, 1987
23	March 24, 1987	March 25, 1987
51	May 26, 1987	May 27, 1987
10	April 8, 1988	April 11, 1988

3. Casing and Cementing. The injection well, WDW #1, is cased and cemented to prevent the movement of fluids into or between underground sources of drinking water. The casing and cement used in the construction of the well are shown in Attachment C. (35 I.A.C. 730.112(b))
  - a. Surface Casing. Surface casing is set and cemented to a subsurface depth of 224 feet. Cementing was accomplished with 10.92 cubic yards of regular cement with 3% calcium chloride additive cement. The pump and plug cementing method was used to seal the well bore and fill the annular space between the hole and casing to the surface of the ground.
  - b. Intermediate casings. The bottom of the intermediate casing strings are set at 2773 feet and 3600 feet and cemented with pozmix resin cement with 18% salt and 4% gel additives using the pump and plug method. The casing set at 2773 feet casing is cemented to the surface and the casing set at 3600 feet casing is cemented to a



depth of 1870 feet below the Kelley bushing and filled with kerosene to the surface as indicated in Attachment C.

c. Longstring Casing. Long string casing is set to the top of the disposal zone, at approximately 3613 feet, and cemented with Epseal cement using the pump and plug method.

4. Tubing Specifications. Injection will only be through the 2 7/8 inch OD (outer diameter) fibercast tubing between 0 and approximately 3343 feet and through 2 3/8 inch OD fibercast tubing approximately between 3345 and 3670 feet. Tubing specifications are contained in Attachment C of this permit. Any changes in the tubing material and design shall be submitted to the Permit Section, Division of Land Pollution Control for approval at least 30 days prior to installation. (35 I.A.C. 730.112(b))

5. Conductivity Rings. Except as noted below, two sets of conductivity rings shall be maintained at all times. Sets of conductivity rings shall be set at approximately 3575 feet and the upper set at approximately 3560 feet. A minimum of two wires shall be attached to each conductivity ring so that the permittee can monitor the continuity of the electrode system. If either set of rings fails, the failing set shall be repaired during the next scheduled mechanical integrity test; provided, however, that the well shall not be operated unless one set of rings is in operation.

6. Access During Logging and Testing. The Agency and Illinois State Water and Geological Surveys will be given access to witness the running of any logs or tests. (35 I.A.C. 702.149)

7. Blowout Preventer. A permanent blowout preventer shall be maintained on the wellhead at all times.

#### B. OPERATING, MONITORING AND REPORTING REQUIREMENTS

##### 1. Operating Requirements (35 I.A.C. 730.113(a))

a. Maximum injection pressure. The maximum injection pressure at the wellhead shall not exceed 100 psig.

b. Maximum injection rate. The maximum injection rate shall not exceed 125 gpm. Permittee may seek a minor modification to this permit to allow an increase in the maximum injection rate upon installation of an injection rate recorder which ensures that the range exceeds 20% of the maximum injection rate.



- c. Waste Parameters. The injected waste shall not exceed the maximum limits of the parameters indicated below.

<u>Parameters</u>	<u>Haz Waste Code</u>	<u>Range or Maximum Limit</u>
Total Organic Carbon (TOC)		200 mg/l
Arsenic	D004	500 mg/l
pH		5-10*
Specific Gravity		1.2

\*Excursions\*\* from the pH range of 5-10 are permitted subject to the following limitations:

- 1) the total time during which the pH values are outside the required range of pH values shall not exceed 7 hours and 26 minutes in any calendar month and
- 2) no individual excursion from the range of pH values shall exceed 60 minutes.

\*\* For purposes of this permit, an excursion is an unintentional and temporary incident in which the pH value of injected waste water exceeds the range set forward in the permit.

- d. Annulus Protection. The annulus between the tubing and the long string of casings and the annulus between the 9 5/8 inch and 7 inch casing shall be filled with kerosene. A pressure of  $235 \pm 20$  psig shall be maintained on the inner annulus. A pressure  $65 \pm 15$  psig shall be maintained on the 9 5/8 inch and 7 inch annulus.
- e. Annulus injection prohibition. Injection between the outer most casing, protecting underground sources of drinking water, and the well bore is prohibited.
- f. Prohibition of excessive pressure. Except during stimulation, injection pressure at the wellhead shall not exceed a maximum which shall be calculated so as to assure that pressure in the injection zone during injection does not cause:
- i. initiation of new fractures or propagate existing fractures in the injection zone,
  - ii. initiation of fractures in the confining zone,
  - iii. migration of injected fluids into any underground source of drinking water,



- iv. displacement of formation fluid into any underground source of drinking water, or
    - v. non-compliance with 35 I.A.C. 730 operating requirements.
  - g. Filtration. All waste that is injected into the well shall be filtered through a 100 micron or smaller particle filter.
2. Monitoring Requirements (35 I.A.C. 730.113(b))
- a. Sampling. The injection waste shall be sampled and monitored at the wellhead and shall be analyzed at the frequency specified in Attachment D. The pH and temperature shall be measured at the time the sample for specific gravity is taken and used when the sample is analyzed.
  - b. Continuous recording devices. The following continuous recording devices or their equivalents are used to monitor the injection pressure, flow rate, pH, temperature, and annulus pressure:
    - i. Injection pressure gauges - Foxboro Model 40 recorder.
    - ii. Casing-tubing annulus pressure gauges - Foxboro Model 40 recorder.
    - iii. Flow meters - Foxboro Model 40 recorder and Foxboro 2803-SABA-DB recorder.
    - iv. pH recording device - Foxboro 40 PR-RFE3F-ESA21AN recorder on a 7 day rotational chart.
    - v. Temperature - Safecare PG-73 nonrecorder.
    - vi. Annulus conductivity and cable continuity - Easterline Angus MRL Multipoint Recorder/Logger.
  - c. Recording device ranges. All recording devices, except pH recorders, will exceed maximum operating ranges by 20%.
3. Waste Analysis Plan (35 I.A.C. 704.187)

The Permittee shall develop and follow a written Waste Analysis Plan which describes the procedures which will be carried out to comply with Permit Conditions for sampling in the Monitoring Requirements of Condition B2a. This plan shall be submitted to the Permit Section, Division of Land Pollution Control for



approval within forty-five (45) days after the date of this modified permit is in effect. A copy of the plan shall be kept at the facility. At a minimum, the plan must specify:

- a. The parameters for which each hazardous waste will be analyzed and the rationale for the selection of these parameters;
- b. The test methods which will be used to test for these parameters; and
- c. The sampling method which will be used to obtain a representative sample of the waste to be analyzed and the frequency of sampling and analysis for each parameter.
- d. Sample preservation. Organic sampling and analytical procedures consistent with the "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods" (SW-846) shall be incorporated in the waste analysis plan.
- e. Sampling methods for monitoring wells will also be addressed in the Waste Analysis Plan.

4. Groundwater Monitoring Plan. The Permittee shall submit a Groundwater Monitoring Plan to the Permit Section, Division of Land Pollution Control no later than forty-five (45) days after the date of this modified permit is in effect. This plan will be designed to detect any migration of fluids into and pressure build-up in the Underground Sources of Drinking Water (USDWs) and/or aquifers containing less than 10,000 mg/l of total dissolved solids (TDS). This plan should also include the parameters to be measured and the frequency of monitoring. The elements of an acceptable Groundwater Monitoring Plan are set forth in Attachment H. The time for submission may be extended for good cause if the Agency receives a request before the expiration of the forty-five (45) day period and said request demonstrates the need for an extension. The Permittee may request waiver of this requirement within forty-five (45) days of the effective date of this modified permit if it can be demonstrated that there is no potential for fluid movement above the confining zone caused by injection activity or that USDWs are completely absent within the area of review. Upon approval of the Groundwater Monitoring Plan, or waiver of the groundwater monitoring requirements, the plan or waiver will be incorporated into this permit as Attachment H. All extensions or waivers granted must be in writing. (35 I.A.C. 730.113)

5. Monthly Reporting Requirements

- a. Report submittal date. Monthly monitoring reports are due by the 28th day of the month immediately following the



reporting period. A reporting period is defined as a calendar month.

- b. Contents of monthly reports. The monthly reports shall include:
  - i. Daily value for total volume and daily maximum, minimum, and average values for annulus pressure, injection pressure, and flow rate, using the procedure in Attachment E.
  - ii. The number of start ups during each day.
  - iii. Total gallons injected to date.
  - iv. Monthly summary of:
    - (a) maximum, minimum, and average values for annulus pressure, injection pressures and flow rate using the procedure in Attachment E.
    - (b) total volume.
    - (c) total number of well startups.
  - v. Operating charts for the month submitted on 7 day circular charts for:
    - (a) annulus pressure
    - (b) injection pressure
    - (c) flow rate
  - vi. Results of chemical analyses required by this permit.
  - vii. A copy of the annulus conductivity and cable continuity recording charts.
- c. Other information in monthly reports. The results of any of the following tests or work shall be reported with the second monthly report after completion of the test or work:
  - i. Periodic tests of mechanical integrity.
  - ii. Copies of any logs run on the well submitted with a log analysis.
  - iii. Any other test conducted on the injection well.



- iv. Any well work over.
- v. Maintenance performed on monitoring devices or well components.
- vi. Changes of gauges, pipes, and other well components and monitoring devices.
- d. Illegible reports will be returned to the Permittee and deemed not filed. All graphs and charts will be labeled appropriately.
- e. Report submittal addresses.

One copy of the monthly reports will be submitted to each of the following addresses:

- i. Illinois Environmental Protection Agency  
Division of Land Pollution Control - #24  
Compliance Section  
2200 Churchill Road  
P.O. Box 19276  
Springfield, Illinois 62794-9276
- ii. Illinois Environmental Protection Agency  
Division of Land Pollution Control  
Field Operations Section  
4500 South 6th Street  
Springfield, Illinois 62706
- iii. Illinois State Geological Survey  
Groundwater Section (Deep Well Disposal)  
Attention: Mr. Ross Brower  
615 East Peabody Drive  
Champaign, Illinois 61820
- iv. Illinois State Water Survey  
Ground Water Section (Deep Well Disposal)  
Attention: Mr. Adrian Visocky  
2204 Griffith Drive  
Champaign, Illinois 61820

- C. EFFECT OF PERMIT. The existence of a UIC permit shall not constitute a defense to a violation of the Environmental Protection Act, or Subtitle G except for development, modification, or operation without a permit. A permit may be modified or revoked during its term for cause set forth in 35 I.A.C. 702.183 through 701.186. (35 I.A.C. 702.181)



The Permittee is allowed to engage in underground injection in accordance with the conditions of this permit. The underground injection activity, authorized by this permit shall not allow the movement of fluid containing any contaminant into underground sources of drinking water, if the presence of that contaminant may cause a violation of any primary drinking water regulation under 40 CFR Part 142 or may otherwise adversely affect the health of persons or the environment. Any underground injection activity not authorized in this permit is prohibited. (35 I.A.C. 704.122)

Compliance with the terms of this permit does not constitute a defense to any action brought under Section 1431 of the Safe Drinking Water Act (SDWA) or any other law governing protection of public health or the environment for any imminent and substantial endangerment to human health, or the environment. In the case of disagreement between the conditions of this permit and the application, the permit conditions shall govern.

- D. **PERMIT ACTIONS.** This permit may be modified or revoked for cause as specified in 35 I.A.C. 702.183 through 702.187. The filing of a request by the Permittee for a permit modification or revocation, or a notification of planned changes or anticipated noncompliance, does not stay the applicability or enforceability of any permit condition. (35 I.A.C. 702.146)
- E. **SEVERABILITY.** The provisions of this permit are severable, and if any provision of this permit, or the application of any provision of this permit is held invalid, the application of such provision to other circumstances, and to the remaining provisions of this permit shall not be affected thereby. (35 I.A.C. 700.107)
- F. **CONFIDENTIALITY.** In accordance with Section 7 of the Environmental Protection Act, certain information submitted to the Agency pursuant to this permit may be claimed as confidential by the submitter. Any such claim must be asserted at the time of submission by stamping the words "confidential business information" on each page containing such information. If no claim is made at the time of submission, Agency may make the information available to the public without further notice. If a claim is asserted, the validity of the claim will be assessed in accordance with the Board and Agency procedures. Claims of confidentiality for the following information will be denied:
1. The name and address of the Permittee;
  2. Information which deals with the existence, absence or level of contaminants in drinking water.
- G. **PENALTIES FOR VIOLATIONS OF PERMIT CONDITIONS.** Any person who violates a permit requirement is subject to civil penalties, fines,





and other enforcement action under SDWA and the Environmental Protection Act.

#### H. DUTIES AND REQUIREMENTS

1. Duty to Comply. The Permittee shall comply with all applicable Underground Injection Control (UIC) program regulations and conditions of this permit, except to the extent and for the duration such noncompliance is authorized by a temporary emergency permit under 35 I.A.C. 704.163. Any permit noncompliance constitutes a violation of the Illinois Environmental Protection Act and is grounds for enforcement action, permit revocation, modification, or denial of a permit renewal application. Such noncompliance may also be grounds for enforcement action under the Resource Conservation and Recovery Act (RCRA). (35 I.A.C. 702.141 and 35 I.A.C. 704.181(a))
2. Duty to Reapply. If the Permittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the Permittee must submit an application for a new permit at least 180 days before this permit expires. (35 I.A.C. 702.142)
3. Need to Halt or Reduce Activity. It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit. (35 I.A.C. 702.143)
4. Duty to Mitigate. The Permittee shall take all reasonable steps to minimize or correct any adverse impact on the environment resulting from non-compliance with this permit. (35 I.A.C. 702.144)
5. Proper Operation and Maintenance. The Permittee shall at all times properly operate and maintain all facilities, systems of treatment, and controls (and related appurtenances) which are installed or used by the Permittee to achieve compliance with the conditions of this permit. Proper operation and maintenance includes effective performance, adequate funding, adequate operator staffing and training, adequate laboratory and process controls, and appropriate quality assurance procedures. This provision requires the operation of backups, auxiliary facilities, or similar systems used only when necessary to achieve compliance with the condition of the permit. (35 I.A.C. 702.145)
6. Property Rights. Issuance of this permit does not convey any property rights of any sort, or any exclusive privilege. (35 I.A.C. 702.147)



7. **Duty to Provide Information.** The Permittee shall furnish to the Agency, within the specified times, any information which the Agency may request, to determine whether cause exists for modifying, revoking and reissuing, terminating this permit, or to determine compliance with this permit. The Permittee shall also furnish to the Agency, upon request, copies of records required to be kept by this permit. (35 I.A.C. 702.148)
8. **Inspection and Entry.** The Permittee shall allow an authorized representative of the Agency, upon the presentation of credentials and other documents as may be required by law, and at reasonable times to:
  - a. Enter upon the Permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit;
  - b. Have access to and copy any records that must be kept under the conditions of this permit;
  - c. Inspect any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; and
  - d. Sample or monitor for the purposes of assuring permit compliance or as otherwise authorized by the appropriate Act, any substances or parameters at any location. (35 I.A.C. 702.149)
9. **Monitoring.** Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity. (35 I.A.C. 702.150(a))
10. **Records.** (35 I.A.C. 702.150(b), (c) and 704.181(b))
  - a. The Permittee shall retain records of all monitoring information, including all calibration, maintenance records, original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least 3 years from the date of the sample, measurement, report, or application. This period may be extended by request of the Agency at any time.
  - b. **Retention of records.** The Permittee shall retain records concerning the nature and composition of all injected fluids until three years after the completion of any plugging and abandonment procedures specified under 35 I.A.C. 704.188. The Owner or Operator shall continue to



retain the records after the three year retention period unless the owner or operator delivers the records to the Agency or obtains written approval from the Agency to discard the records.

- c. Records of monitoring information shall include:
  - i. The date, exact place, and time of sampling or measurements;
  - ii. The individual(s) who performed the sampling or measurements;
  - iii. A precise description sampling methodology and handling;
  - iv. The date(s) analyses were performed;
  - v. The individual(s) who performed the analyses;
  - vi. The analytical techniques or methods used; and
  - vii. The results of such analyses.
- 11. Signatory Requirements. All reports, or information submitted to the Agency shall be signed and certified as required in 35 I.A.C. 702.126. (35 I.A.C. 702.151)
- 12. Reporting Requirements.
  - a. Planned changes. The Permittee shall give written notice to the Agency within 15 days of any planned physical alterations or additions to the permitted facility. (35 I.A.C. 702.152(a))
  - b. Anticipated noncompliance. The Permittee shall give advance notice to the Compliance Section, Division of Land Pollution Control of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements. (35 I.A.C. 702.152(b)).
  - c. Other noncompliance. The Permittee shall report all instances of noncompliance not reported under 35 I.A.C. 702.152 paragraphs (d), (e) and (f) at the time monitoring reports are submitted. The reports shall contain the information referenced in 35 I.A.C. 702.152 subsection (f). (35 I.A.C. 702.152(g))
  - d. A summary of the reporting dates can be found in Attachment G for all information required by this permit.



### 13. Corrective Action Requirements

- a. The permitted well will be immediately shut-in and the Compliance Section, Division of Land Pollution Control will be notified if:
  - i. upward fluid migration occurs through the well bore of any unknown, improperly, or unplugged well(s) due to injection of permitted fluid and/or
  - ii. any problems developed with the casing of the injection well.
- b. The improperly plugged or unplugged well(s) will then be plugged and abandoned immediately. A copy of the plugging affidavit(s) filed with the Oil and Gas Division, Illinois Department of Mines and Minerals must be submitted to the Compliance Monitoring Section, Division of Land Pollution Control.
- c. Telephone notification within twenty-four (24) hours of the discovery of the problem and written confirmation transmitted by letter within five (5) days.
- d. In case of well failure the procedures in Attachment F will be followed. An investigation of the indicated well failure and plan of action to eliminate the problem must be conducted and the remedial work performed.

### 14. Twenty-four Hour Reporting.

- a. The Permittee shall report to the Compliance Section, Division of Land Pollution Control any noncompliance which may endanger health or the environment. Any information shall be provided orally within 24 hours from the time the Permittee becomes aware of the circumstances.
- b. A written submission shall also be provided to the Compliance Section, Division of Land Pollution Control within 5 days of the time the Permittee becomes aware of the circumstances. The written submission shall contain:
  - i. a description of the noncompliance and its cause;
  - ii. the period of noncompliance, including exact dates and times;
  - iii. if the noncompliance has not been corrected, the anticipated time it is expected to continue; and



- iv. steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance. (35 I.A.C. 702.152(f))
  - c. The following shall be included as information which must be reported within 24 hours (35 I.A.C. 704.181(d)):
    - i. Any monitoring or other information which indicates any contaminant may cause an endangerment to underground sources of drinking water.
    - ii. Any noncompliance with a permit condition or malfunction of the injection system which may cause fluid migration into or between underground sources of drinking water.
- 15. Transfer of Permit.
  - a. Transfers. This permit is not transferable to any person except after notice to the Permit Section, Division of Land Pollution Control. The Agency may require modification of the permit to change the name of the Permittee and incorporate such other requirements as may be necessary under the appropriate Act. (35 I.A.C. 702.152(c))
  - b. Transfer by modification. A permit may be transferred by the Permittee to a new owner or operator only if the permit has been modified (under 702.183 through 185), reissued, or a minor modification made (under Section 702.187(d)), to identify the new permittee and incorporate such other requirements as may be necessary under the appropriate Act. The new owner or operator to whom the permit is transferred shall comply with all the terms and conditions specified in such permit. (35 I.A.C. 702.182(a))
- 16. Financial Responsibility. (35 I.A.C. 704.189) The Permittee will maintain financial responsibility and resources to close, plug, and abandon the underground injection wells in a manner prescribed by the Agency, and described in Attachment A.
  - a. The Permittee must show evidence of financial responsibility to the Permit Section, Division of Land Pollution Control by the submission of a surety bond, other adequate assurance such as financial statements, or other materials acceptable to the Agency.
  - b. The financial documents submitted must be revised and maintained as specified in 35 I.A.C. 704 and 40 CFR 144.



17. Cost Estimates for Plugging and Abandonment. (35 I.A.C. 704.212)

- a. The owner or operator will maintain a written estimate, in current dollars, of the cost of plugging the injection well in accordance with the plugging and abandonment procedure (Attachment A). The cost estimate must equal the cost of plugging and abandonment at the point in the facility's operating life when the extent and manner of its operation would make plugging and abandonment the most expensive, as indicated by its plan.
- b. The owner or operator must adjust the cost estimate for inflation within 30 days after each anniversary of the date on which the first cost estimate was prepared. The adjustment must be made as specified in paragraphs (i) and (ii) of this condition, using an inflation factor derived from the annual Oil and Gas Field Equipment Cost Index. The inflation factor is the result of dividing the latest published annual Index by the Index for the previous year.
  - i. The first adjustment is made by multiplying the cost estimate by the inflation factor. The result is the adjusted cost estimate.
  - ii. Subsequent adjustments are made by multiplying the latest adjusted cost estimate by the latest inflation factor.
- c. The owner or operator must review the cost estimate whenever a change in the plan increases the cost of plugging and abandonment. The revised cost estimate must be adjusted for inflation as specified in paragraph (b).
- d. The owner or operator must keep the following at the facility during the operating life of the facility:
  - i. the latest cost estimate prepared in accordance with paragraphs (a) and (c) and,
  - ii. the latest adjusted cost estimate prepared in accordance with paragraph (b). (35 I.A.C. 704.212)

18. Incapacity (35 I.A.C. 704.230)

- a. An owner or operator shall notify the Agency by certified mail of the commencement of a voluntary or involuntary proceeding under 11 U.S.C. (Bankruptcy), naming the owner or operator as debtor, within 10 business days after the commencement of the proceeding. A guarantor of a corporate guarantee as specified in 35 I.A.C. 704.219 must make such



- a notification if the guarantor is named as debtor, as required under the terms of guarantee in 35 I.A.C. 704.240.
- b. An owner or operator who fulfills the requirements of 35 I.A.C. 704.213 by obtaining a letter of credit, surety bond or insurance policy will be deemed to be without the required financial assurance in the event of bankruptcy, insolvency or a suspension or revocation of the license or charter of the issuing institution. The owner or operator must establish other financial assurance within 60 days after such event.
19. Revocation of Permits. (35 I.A.C. 702.186) The Illinois Pollution Control Board will revoke a permit during its term in accordance with Title VIII of the Illinois Environmental Protection Act or the Agency will deny permit renewal for the following causes:
- a. The Permittee's violation of the Environmental Protection Act or regulations adopted thereunder;
- b. Noncompliance by the Permittee with any condition of the permit;
- c. The Permittee's failure in the application or during the permit issuance process, to disclose fully all relevant facts, or the Permittee's misrepresentation of any relevant facts at any time; or
- d. A determination that the permitted activity endangers human health or the environment and can only be regulated to acceptable levels by permit modification or revocation.
20. State Mining Board Permits. Issuance of this permit does not relieve the Permittee of the responsibility of complying with the provisions of Illinois State Mining Board Rules and Regulations and an Act in Relation to Oil, Gas, Coal, and Other Surface and Underground Resources. (Rule II, Illinois Department of Mines and Minerals Rules and Regulations)
21. False or Omitted Information.
- a. The Permittee shall not make any false statement, representation, or certification in any application, record, report, plan, or other document submitted to the Agency, the United States Environmental Protection Agency (USEPA), or required to be maintained under this permit.
- b. If or when the Permittee becomes aware that they failed to submit any relevant facts in a permit application or



UIC-003-W1-AC

incorrect information was submitted in a permit application or in any report to the Agency, the Permittee shall promptly submit such facts or correct information to the Permit Section, Division of Land Pollution Control within ten (10) days. (35 I.A.C. 702.152(h))

22. **Restriction on Unpermitted Waste.** No waste other than those noted in this permit shall be injected. The Permittee shall submit, on January 15 of each year, a certified statement attesting compliance with this requirement for the previous calendar year. (35 I.A.C. 702.160)
23. **Plugging and Abandonment.**
  - a. The Permittee will plug and abandon the injection well in accordance with the schedule and provisions of the approved plugging and abandonment plan herein incorporated as Attachment A. (35 I.A.C. 702.188)
  - b. No later than thirty (30) days after plugging and abandonment the Permittee will submit a report to the Compliance Section, Division of Land Pollution Control. The report shall be certified as accurate by the person who performed the plugging operation, and will consist of:
    - i. A statement that the well was plugged in accordance with the plan most recently submitted to the Agency; or
    - ii. A statement defining the actual plugging and explaining why the Agency should approve such deviation, if the actual plugging differed from the approved plan. Any deviation from a previously approved plan which may endanger underground sources of drinking water is cause for the Agency to require the operator to replug the well; and
    - iii. Copy of well plugging affidavit submitted to Illinois Department of Mines and Minerals.
  - c. If the approved plugging and abandonment plan should change, a revised plan shall be submitted to the Permit Section, Division of Land Pollution Control for approval at the time of the next monthly report. Once approved, the revised plugging and abandonment plan will replace Attachment A and become as part of this permit as a minor modification.
24. **Conversion or Abandonment.** The Permittee will notify the Permit Section, Division of Land Pollution Control 45 days prior to conversion or abandonment of the wells. Any modification to the





plugging and abandonment or conversion found in Attachment A must be submitted for approval 180 days prior to actual conversion or abandonment. (35 I.A.C. 704.181(e))

25. Inactive Wells. (35 I.A.C. 704.188) After cessation of injection for two (2) years the Permittee will plug and abandon the well in accordance with Attachment A of this permit and 35 I.A.C. 730.110 unless the Permittee has:
  - a. Provided notice to the Compliance Section, Division of Land Pollution Control; and
  - b. Described actions or procedures, which are deemed satisfactory by the Agency, to ensure the well will not endanger underground sources of drinking water during the period of temporary abandonment. These actions and procedures shall include compliance with the technical requirements applicable to active injection wells, including mechanical integrity testing, unless waived by the Agency in writing.
26. Mechanical Integrity. (35 I.A.C. 704.190)
  - a. A demonstration of mechanical integrity will be conducted to ensure the well has integrity during the life of this permit. A descriptive report interpreting the results will be submitted with log analyses to the Compliance Section, Division of Land Pollution Control by an independent Log Analyst. The procedures specified in Attachment B of this permit will apply unless Allied-Signal Inc., submits and the Agency approves alternative mechanical integrity testing procedures.
  - b. The Permittee will demonstrate the absence of significant leaks in the casing or injection tubing by use of a pressure test and surface tubing pressure test to be conducted bi-annually.
  - c. The Permittee will demonstrate the absence of significant fluid movement into an underground source of drinking water through vertical channels adjacent to the injection well bore by use of a bi-annual temperature log of the casing and an annual radioactive tracer survey run through the tubing.
  - d. The Permittee will demonstrate, on a quarterly basis, the integrity of the electrode system.
  - e. Additional Mechanical Testing. In addition to a pressure test, temperature log, and radioactive tracer survey, the



UIC-003-W1-AC

Permittee will inform the Compliance Section, Division of Land Pollution Control of any additional mechanical integrity test, logs, or inspections at least thirty (30) days prior to the demonstration of mechanical integrity.

- f. A cement bond/evaluation log will be run in the entire length of the long string casing at least once every four years.
  - g. A casing inspection log will be run with the cement bond log to determine the thickness and condition of the long string casing.
  - h. The Permittee will notify the Compliance and Permit Sections, Division of Land Pollution Control of their intent to demonstrate mechanical integrity at least thirty (30) days prior to a demonstration. The type and exact procedures for each test must be specified in the notice.
  - i. The Permittee will cease injection if a loss of mechanical integrity as defined by 35 I.A.C. 730.108, or Attachment B of this permit, becomes evident during operation or at the time of the mechanical integrity demonstration. Operation will not be resumed until the Permittee has complied with the provisions of this permit regarding mechanical integrity demonstration and testing.
  - j. Gauge Calibration. All gauges used in mechanical integrity demonstrations and in daily operations will be calibrated according to the procedures traceable to the National Bureau of Standards, initially and at least annually thereafter. A copy of the calibration certificate will be submitted to the Agency on January 15 of each year. In addition, recording devices will be time synchronized at least quarterly.
  - k. In addition to the mechanical integrity demonstration required by this permit, the Agency may require the Permittee to conduct a demonstration of the mechanical integrity of the well when evidence reasonably indicates that the integrity of the well is in question.
27. Contingency Plan. The Permittee will follow the contingency plan outlined in Attachment F. (35 I.A.C. 702.160)
28. EP Toxicity. The permittee will perform an extraction procedure (EP) toxicity in accordance with 35 I.A.C. 721.124 for arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver on a composite waste stream. The laboratory results of the EP toxicity will be submitted within 30 days after the effective



date of this modified permit monthly report to the Compliance Section, Division of Land Pollution Control and annually thereafter.

29. Neutralization. The Permittee will operate and maintain a system for neutralization of the plant process wastewater.
30. The Agency has approved the information received to meet Section 39(h) of the Environmental Protection Act on the condition that the permittee continue to research the arsenic contamination. The permittee will submit to the Permit Section, Division of Land Pollution Control by November 1, 1989 a detailed report dealing with the source of arsenic, means of treatability, ways to eliminate arsenic from source material, and other ways to manage the waste to eliminate the arsenic contamination. The permittee should demonstrate the technical feasibility and economical reasonableness of recycling the arsenic for reuse or treatment.
31. Continuing Releases at Permitted Facilities. Issuance of this Underground Injection Control (UIC) permit does not release the permittee from complying with applicable requirements of the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act of 1976, as amended (42 USC., §6901 et seq., commonly known as RCRA), and the 1984 Hazardous and Solid Waste Amendments (HSWA). In particular, Section 3004(u) of HSWA requires owner/operators of hazardous waste treatment, storage and disposal facilities seeking permits to take corrective action for all releases of hazardous waste or hazardous waste constituents from any solid waste management unit (SWMU), which includes the injection well. If at any time, the USEPA should determine that a release of hazardous waste or hazardous waste constituents is taking, or has taken place from the well or the injection zone, corrective action requirements and a schedule for their completion may be imposed by USEPA under Section 3004(u) and 3008(h) HSWA. This permit does not constitute a RCRA permit-by-rule, and, further, does not release the Permittee from complying with the corrective action requirements for other SWMUs at the same facility, nor any other RCRA and HSWA regulations applicable to units and operations at this facility.
32. Restrictions on Future Land Use for Hazardous Facilities. (35 I.A.C. 724.219 & 220) Within 90 days after final plugging and abandonment, the owner or operator must submit to the Compliance Section, Division of Land Pollution Control, to the County Recorder, and to any local zoning authority a survey plat indicating the location of the disposal well with respect to permanently surveyed bench-marks. The plat must be prepared and certified by a professional land surveyor. In addition, the



owner or operator must submit to the Agency, the County Recorder and any local zoning authority a record of the type, location and quantity of hazardous waste placed in the well. For wastes disposed before these regulations were promulgated, the owner or operator must identify the type and quantity of the wastes to the best of their knowledge and in accordance with any record which has been kept. Any changes in the type, location or quantity of hazardous wastes disposed of within the facility which occurred after the survey plat and record of wastes had been filed must be reported to the agencies where original plat and record were filed.

The owner of the property where a disposal well is located must record, in accordance with Illinois law, a notation on the deed to the facility property, or on some other instrument normally examined during a title search, to notify, in perpetuity, a potential purchaser of the property of the following:

- (1) the land has been used to dispose hazardous waste;
- (2) the steel plate and cement plug in the well must never be disturbed or removed;
- (3) the survey plat and record of the type well location, and quantity of hazardous waste has been filed with the Illinois Environmental Protection Agency, the County Recorder, and any local zoning authority.



Attachment A

PROCEDURES FOR PLUGGING AND ABANDONMENT OF WASTE DISPOSAL #1

1. Displace the tubing and wellbore with sufficient fresh water to flush all waste out of the tubular goods and near wellbore area. Remove all flow lines, associated equipment and instrumentation from wellhead and immediate area.
2. Move in well service rig, including temporary storage tanks, pump and pipe racks.
3. Kill well with adequately weighted water to place fluid level below the well head and prevent the backflow of waste.
4. Remove wellhead. Fill mud tanks with fresh water.
5. Pull out of hole laying down 2 7/8" and 2 3/8" fiberglass injection tubing. Fibercast tubing does not have sufficient strength to use during plugging and abandonment procedures therefore a steel workstring will be required.
6. Rig up wireline service unit and run appropriate logs (including electrical logs) and tests to determine casing condition and determine if channeling has developed behind the 7"/5 1/2" and 7"/4 1/2" protection casing. Also, if it is technically feasible, determine if the cement plug from 4025 feet to 4154 feet is leaking. Rig down wireline service unit. Correct any problems as required.
7. Make up 4 3/4" drill bit and casing scraper on workstring and trip in hole to top of 4 1/2" Fibercast casing (about 3553'). This step will gauge and prepare the 5 1/2" casing for running a cement retainer. Pull out of hole, lay down bit and scraper.
8. Rig up cementing equipment. Make up 5 1/2" cement retainer assembly and run in hole to top of 4 1/2" Fibercast casing. Set retainer at 3550+. Mix and pump sufficient 50/50 Pozmix cement to fill the open hole section from about 4000' to 3623' (about 103 sacks). The purpose of this cement is to form a base on which to emplace a volume of corrosion resistant cement.
9. Tag bottom of well to ensure that a base has been established.
10. Follow the pozmix cement with epoxy resin cement. Using necessary spacer fluids, displace enough resin cement to form a 80' plug beneath the retainer, then close the retainer valve. Fresh water may be used as displacement fluid.
11. Disengage tubing from retainer and emplace a 50' epoxy cement plug on top of the cement retainer (about 167 gallons of epoxy cement will be required). Pull tubing to about 3320 feet and reverse the hole clean.



Allow cement to set overnight before tagging top of plug to confirm proper set-up. Pressure test plug to 1000 psig.

12. Mix and pump an accelerated Class "A" cement plug from the top of the epoxy cement plug to about 1870 feet (about 161 sacks). Pull workstring to about 1690 feet and reverse the workstring clean. Wait on cement (about 4 hours) and confirm location by tagging.
13. Rig up perforating unit and perforate through 5 1/2" and 7" casing into 7" x 9 5/8" annulus at about 1865'.
14. Displace oil in 7" x 9 5/8" annulus by circulating with water or chemical flush then displace with Class "A" cement from about 1865' to the surface.
15. Fill the 5 1/2" casing with cement to the surface (about 450 sacks).
16. Remove bradenhead, cut casings off at 3' below grade and weld 1/2" plate with 1 inch bleed valve across 13 3/8" surface pipe. Inscribe on plate, in a permanent manner, the following information: (1) operator name, (2) closure date and (3) UIC permit number.
17. Release all equipment and clean up location.
18. Submit closure data to regulatory agency.
19. File a plugging affidavit, in duplicate, on Mining Board form with the Oil and Gas Division of Illinois Department of Mines and Minerals. A copy of this affidavit shall be filed with the Compliance Section, Division of Land Pollution Control within 30 days following plugging and abandonment.



Attachment B

PROCEDURES USED FOR MECHANICAL INTEGRITY

Pressure Test

1. Time permitting, add maximum amount of fresh water to injection stream at least 12 hours prior to well shutdown.
2. Shut off all sources of process waste water and inject a minimum of 1100 gallons of "city" water into well.
3. Shut down deep well and depressurize inner annulus by backflowing annulus kerosene into the surface kerosene tank.
4. Remove well head shed, dismantle surface waste water transfer line.
5. Move in well service rig and pull out injection tubing.
6. Insert a casing plug near the bottom of the 5 1/2" casing.
7. Fill annulus with water and allow to stabilize.
8. Pressurize the casing with water to 500 psig, wait four (4) hours to allow for temperature stabilization, repressurize to 500 psig if necessary, and maintain pressure for 1 hour to determine the integrity of casing.
9. Pressurize the 9 5/8 inch and 7 inch annulus space to 100 psig and maintain pressure for 1 hour to determine the integrity of the annular space.
10. Corrective action will be taken if the pressure change is more than 3 percent for any 30 minute period following the stabilization time.
11. Remove casing plug.
12. If needed, address any well deficiencies as required.
13. Install injection tubing (previously surface pressure tested to 300 psig).
14. Install surface transfer line and well shed, repressurize inner annulus to normal operating pressure (215-255 psig).
15. Partially backflush annulus kerosene to assure proper operation of electrode monitoring system.
16. Repressurize annulus to normal operating pressure and start up well.
17. Verify proper operation of well by visually inspecting surface lines and monitoring the annular fluid conductivity, injection and annulus pressures, electrode wire continuity and injection flow rate.



18. Plot the data gathered (volume versus annulus pressure) and determine volume of fluid loss for pressure loss.
19. The data obtained, including recording charts from the testing, shall be submitted to the Compliance Monitoring Section, Division of Land Pollution Control. The test data must be submitted with the second monthly report submitted to the Agency following the test. A technical evaluation shall accompany all test results.

#### Quarterly Conductivity Test

1. Stop injecting waste acid for at least 12 hours prior to backflowing annulus kerosene.
2. Depressurize inner annulus by backflowing annulus kerosene into the surface kerosene tank allowing the waste/kerosene interface to move up the annular space.
3. As the interface contacts the electrodes, an increased conductivity of annular fluid should be detected by the monitoring system.
4. The detection of higher conductivity should alert the well operator by:
  - a. direct readout of the conductivity meters
  - b. visual alarm
  - c. audio alarm
  - d. printout of the "alarmed" conductivity on the monitoring system
5. After the above alarm systems have been activated the inner annulus shall be repressurized to the normal operational pressure.
6. Failure to detect higher conductivity constitutes a well failure and appropriate action will be taken.

#### Temperature Log

1. Shut off all sources of process waste water and inject a minimum of 1100 gallons of "city " water into the well.
2. Shut down well and depressurize inner annulus by backflowing annulus kerosene into surface kerosene tank.
3. Remove well shed and dismantle surface waste water transfer line.
4. Move in well service rig and pull out injection tubing while adding a small amount of water into the casing to displace the volume of injection tubing removed.
5. Wait 48 hours after completing step 1 (above) to initiate temperature log.





6. Run baseline temperature survey from the surface down, for the entire length of the well.  
  
Note: All temperature surveys will be run into the well.
7. Install injection tubing.
8. Repressurize inner annulus to normal operating pressure (215-255 psig).
9. Install surface transfer line and well shed.
10. Partially backflush annulus kerosene to assure proper operation of electrode monitoring system.
11. Repressurize annulus to normal operating pressure and start up the well.
12. Verify proper operation of the well by visually inspecting surface lines and monitoring the annulus fluid conductivity, injection and annulus pressures, electrode wire continuity and injection flow rate.
13. The data obtained, including recording charts from the testing, shall be submitted to the Compliance Section, Division of Land Pollution Control. The test data must be submitted with the second monthly report following the test. A technical evaluation shall accompany all test results.

#### Radioactive Tracer Survey

1. Shut off all sources of process waste water and inject a minimum of 1100 gallons of "city" water into the well.
2. Remove well shed and dismantle surface waste water transfer line.
3. Set up relatively constant injection to 10 to 20 gpm city water.
4. Move in and set up RAT rig and tool.
5. Reposition the tool and eject a small amount of iodine or equivalent into the well and track the tracer in the tubing to verify the absences of tubing leaks.
6. Position the tool at the bottom of the injection tubing and eject another slug of iodine tracer or equivalent into the well.
7. Reposition the tool at the top of the injection zone and wait a period of time that it would take to show the absence of vertical migration.
8. Remove tool, install surface transfer line, and well shed.
9. Verify proper operation of the well by visually inspecting surface lines and monitoring the annulus fluid conductivity, injection and annulus pressures, electrode wire continuity and injection flow rate.



10. The data obtained, including recording charts from the testing, shall be submitted to the Compliance Section, Division of Land Pollution Control. The test data must be submitted with the second monthly report following the test. A technical evaluation shall accompany all test results.



Attachment C  
WELL DIAGRAM

1. Surface Casing: 11 1/8", 40 lbs./ft. K-55 casing, set in 17 1/2" hole to 124' (K.S.). Cemented to surface with 14' regular cement with 14 sacks.
2. 1" collar to annularizing vessel.
3. Intermediate Casing: 9 5/8", 16 lb. K-55 casing set in 12 1/4" hole to 116' (K.S.). Cemented to surface with 14' Popsicle with .80 sack and 45 sacks.

4. Oil between  $\pm 9/8"$  and  $\pm 146.7$  in manufacturing vessel.
5. Cement top between  $\pm 9/8"$  and  $\pm 146.7$  in casing at 1470'.

6. Original protection casing is 11 feet  
long as follows: 1970' to 1975' is  
K-55 casing and 174' of 11" P. casing  
between 1970' and 1975' is  
1 1/4" hole. Cemented to 1970' on  
stage 1.  
1st stage, with 150 sq. ft. Porous  
180 hole and 40 gal. Plus 200  
casing.  
2nd stage, with 150 sq. ft. Porous  
180 hole and 40 gal.

During the December, 1973 workover  
7" casing was added out from 1011-  
1090'. This included the original  
casing set at 1040'.

7. Inner protection casing: about 100' below: 1951' of 3 1/2", 17 lb. K-55, Hydril Fluorolene casing. 7' 1/2" OD 1.7 lb/ft. 1500 psi. 70C. Fluorene casing, set in hole to 1011'. Cemented with 100 lb. Special cement and circulated to surface.

8. Pulling-winding annulus filled with  
Kerosene to 1613'.

9. Injection tubing, 3345' of 2 7/8" 2.1 lb/ft, GUS AND fiberglass p. of 2 1/8" OD, 1.4 lb/ft, GUS AND fiberglass to +1670'

10. (3) 4 - Computer Center

11. Lead anodes to counter corrosion interface are located at 1559', 1572', and 1575'.

12. Total length 127' of 2 1/8" CD. 1.1  
TUE 882 fiberglass net without  
to +1470'

13. Diagrammed interval. Entrance at  
Potomac; distances completed 270  
from 1411' to 4000' K.B.L.

14. Current Plug 15 sacks Lacer 20  
4025' to 4150'.

19. T.S. found with Butler, 1952

16. Top of broken off 1 1/2" Pipe  
4895'

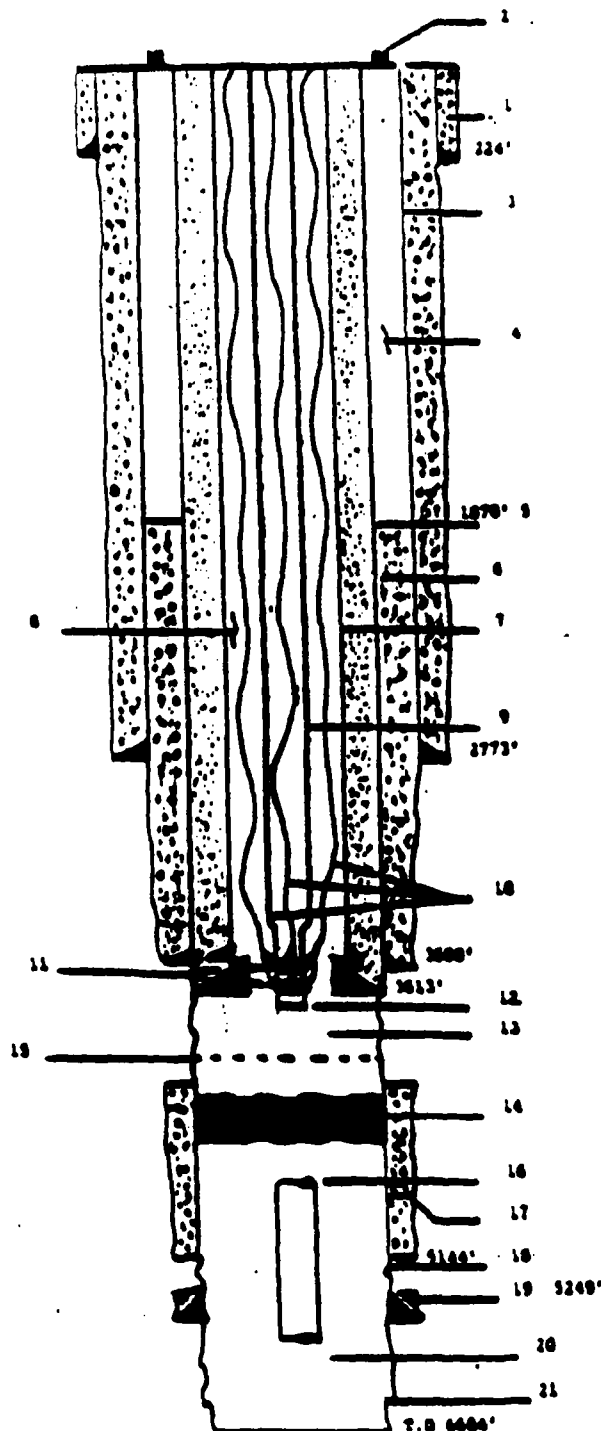
17. 7" PLUMBLINE CASING FROM 49'  
CEMENTED WITH 100 GAL. CEMENT  
(SEE PG. 6 ABOVE).

- LA. 107° 0 1/4" open note.

19. 68' of 7" Fiberglass Casing  
Casing Above (5183' - 5249'

20. 8 1/4" open hole from 9140'

21. 7 7/8" open hole from 6150'



NOTE: All measurements from E.3. 1' above G.L.



Attachment D

CHEMICAL PARAMETERS FOR MONITORING PROGRAM

<u>Parameter</u>	<u>Analytical Frequency*</u>
Total Acidity	W**
Chloride (mg/l)	W
Fluoride (mg/l)	W
Sodium (mg/l)	W
Free Chlorine (mg/l)	W
Specific Gravity	W
Nickel (mg/l)	W
Arsenic (mg/l)	W
Suspended Solids (mg/l)	W
Viscosity (Centipoise)	M
Phenolics, total recoverable (ug/l)	M
Total Organic Carbons (TOC)	W
Total Organic Halogen (TOX)	M
Organic scan (ppb) (unfiltered)	Q
pH (Units)	C
Temperature (°F)	C
Total Dissolved Solids (mg/l)	W

\*M = Monthly  
W = Weekly  
Q = Quarterly  
C = Continuous

\*\* Monitoring of total acidity may be waived by the Agency as a minor modification upon demonstration by the Permittee that the neutralization system is operating in a stabilized and satisfactory manner.



Attachment E

PROCEDURES FOR CALCULATING AVERAGE VALUES

$$\text{Daily Average Flow Rate} = \frac{\text{gallons of wastewater injected (gal/day)}}{\text{(gal/min) total injection time (hrs/day) x (60 min./hr)}}$$

$$\text{Monthly Average Flow Rate} = \frac{\text{gallons of wastewater injected (gal/month)}}{\text{total injection time (hrs/month) x (60 min./hr)}}$$

$$\text{Daily Average Pressure} = \frac{\text{sum of pressures recorded/day (psig)}}{\text{\# of readings taken/day}}$$

$$\text{Monthly Average Pressure} = \frac{\text{sum of pressures recorded/month (psig)}}{\text{\# of readings taken/month}}$$

All readings to be taken every two (2) hours, except when the annulus is depressurized for mechanical integrity demonstration.



Attachment F

CONTINGENCY PLAN FOR WELL OR EQUIPMENT FAILURE

The injection well has the following alarms which are designed to alert the operator of potential well failures:

Annular Fluid Hi Conductivity. This alarm is activated when the conductivity of the annular fluid in the area surrounding the electrode rings increases beyond the alarm setting of 4,000 micromhos/centimeter.

Electrode Wire Continuity Break. This alarm signals the operator when a failure exists in the electrode wiring.

Well Head Rupture Disk Alarm. This alarm signals the operator when the 90# rupture disk, which is located on the transfer/injection line immediately above the well head, has ruptured.

In addition to the above alarms the following monitoring devices are used to monitor for proper well operation:

Annulus Pressure Gauge  
Injection Flow Rate Meter  
Temperature Gauge  
Annulus Pressure Recorder  
Flow Rate Recorder  
Conductivity/Continuity Recorder  
Flow Totalizer  
pH recording device

Any circumstances that reasonably indicate a potential for well failure require immediate action of the operator including

- 1) Shut off flow to the well.
- 2) Flush tubing with fresh water and inject annulus oil into the annulus to displace the corrosive waste that has entered the tubing or casing.
- 3) Identify and repair the exact failure.

Any indication of a possible well failure requires immediate notification of a plant supervisor. In the event of a surface failure such as a transfer line leak, the well will be shut down and repaired prior to any well start-up.

In addition to actual mechanical well failures, the well will be shut down if it cannot be operated within the limits specified in the permit, (those being 100 psig injection pressure, 125 gpm injection rate, and 235±20 psig annulus pressure) unless prior approval is obtained from the Agency.

In the event of a prolonged well failure, the plant will have to be shutdown with the exception of operating a boiler for heating purposes during cold



weather. In this worst case scenario the plant would generate approximately 400 gallons per day of waste water from boiler operation, 25 gallons per day of waste water for scrubber operations and an average of 3800 gallons per day of collected rainfall. Given an "on-hand" storage capacity of approximately 460,000 gallons, this plant could operate in this mode for 109 days. If for any reason the deep well would not be expected to be made operational during this period, the boiler would be shut down, acid storage would be emptied (negating the need for scrubbers) and rainwater diverted such that it would not collect in the process sewers. These actions would totally eliminate all sources of the deep well effluent.

Any intentions of storing hazardous waste water in tanks for greater than 90 days will require the tanks to go through closure according to 35 I.A.C. 722.134. A closure plan will have to be submitted on the storage tanks, according to 35 I.A.C. 722.134.





Attachment G

SUMMARY OF SUBMITTAL DATES

The following is a summary of submittal dates for data required by this permit. The referenced condition must be consulted for complete details.

<u>Condition</u>	<u>Submittal</u>	<u>Date Due</u>
A 4	Changes in Tubing Specifications	30 days prior to installation
B 3	Waste Analysis Plan	45 days after the date of this modified permit is in effect
B 4	Groundwater Monitoring Plan	45 days after the date of this modified permit is in effect or a later date established pursuant to an extension
B 5	Monthly Operation Reports	28th day of each month
H 2	Duty to reapply	180 days prior to expiration
H 12(a)	Planned changes	15 days prior to planned changes
H 13	Corrective Action Requirements by telephone	24 hours after the discovery
	by letter	5 days after the discovery
H 14	Endangerment of Environment	within 24 hours of the time of endangerment
H 17(b)	Plugging and Abandonment Cost Estimates for Inflation	30 days after each anniversary
H 18(a)	Bankruptcy	10 days after commencement of the proceeding
H 18 (b)	Alternative Financial Responsibility	60 days after such event



UIC-003-W1-AC

<u>Condition</u>	<u>Submittal</u>	<u>Date Due</u>
H 21(b)	Correction of False or Omitted Information	10 days after the discovery
H 22	Restriction on Unpermitted Waste	Jan. 15th of each year
H 23(b)	Certification of Plugging and Abandonment	30 days after plugging
H 24	Plans for Conversion or Abandonment	180 days prior to actual conversion or abandonment
H 24	Notify before Conversion or Abandonment	45 days prior to conversion or abandonment
H 26(e)	Additional Mechanical Integrity Testing	30 days prior to demonstration
H 26(g)	Intent to demonstrate mechanical integrity	30 days prior to demonstration
H 26(i)	Gauge calibration	Jan. 15 of each year
H 28	EP Toxicity	30 days after the effective date of this modified permit and annually thereafter
H 30	Section 39(h) detailed report	November 1, 1989
H 32	Survey plat indicating location of disposal well	90 days after plugging and abandonment
Attachment H	Annual Monitoring Summary	March 1 of each year



Attachment H

GROUNDWATER MONITORING PLAN

The permittee will submit a plan for monitoring the groundwater quality and formation fluid pressure of the first permeable zone immediately overlying the confining layer above the injection zone in accordance with 35 I.A.C. 730.113(B)(4). This plan must be submitted to the Permit Section, Division of Land Pollution Control for approval no later than forty-five (45) days after the date of this modified permit is in effect. A schedule for implementation must be included with the plan.

The plan must include:

- A. A comprehensive report describing the local hydrogeologic framework in which the injection well operates. The report should include:
  1. An interpretation of formation-specific geologic information relating to: a) the adequacy of the confining layer or system; b) the locations and physical characteristics of overlying permeable zones including all underground sources of drinking water (USDWs); and c) an evaluation of faulting, fracturing and jointing. Specific information should be based on historical and current operating records, research of available geologic literature and/or logs from nearby wells. An evaluation should be made of the reliability of the above information and any data gaps identified. Where adequate information does not exist, it must be supplied by actual measurements;
  2. A detailed report on the existence of unplugged, abandoned holes which penetrate the confining layer above the injection zone within a minimum of a 5 mile wide area of review. The report should assess the level of reliability and completeness of existing data on abandoned wells. Where historical records are insufficient, magnetometer surveys or field reconnaissance may be necessary;
  3. Identification of the proposed monitoring zone and a complete description of methods which will be used to determine aquifer parameters such as permeability, transmissivity and storage coefficient;
  4. An evaluation of the vulnerability to contamination of the lowest USDW; and,
  5. A computation of the zone of endangering influence as per 35 I.A.C. 730.106 and a calculation of anticipated pressure build-up in the injection zone over the life of the facility. Data used in these calculations should be supplied by actual measurements.



- B. A monitoring well design and operating plan based on the information in the comprehensive report in A of this attachment. The monitoring well design plan shall include:
1. The number and location of wells designed to: a) detect any leakage of injected fluids above the confining zone; and b) monitor pressure changes by continuous water level recording. A minimum of three (3) wells is recommended to define hydraulic gradient. Monitoring wells should be located as close as physically possible to the injection well.
  2. Well specifications, including:
    - a) drilling and development methods;
    - b) construction details;
    - c) quality assurance plan;
    - d) safety plan;
    - e) proposed mechanical integrity determination;
    - f) step drawdown test to determine well efficiency; and
    - g) television survey (optional).
  3. A sampling plan, including:
    - a) proposed data to be collected during drilling;
    - b) proposed monitoring parameters, including background formation fluid parameters, waste indicator "fingerprint" parameters, and pressure;
    - c) sample collection procedures;
    - d) preservation and shipment;
    - e) analytical procedures; and
    - f) chain of custody control;
  4. Reporting proposal, including:
    - a) initial background survey of formation pressure and water chemistry for the monitoring zone;
    - b) monthly and quarterly submittal of required data; and



c) annual interpretive summary report

Waiver Demonstration

An exemption from groundwater monitoring requirements may be granted if the applicant can conclusively demonstrate that there is no potential for fluid movement above the confining zone caused by the injection activity, or the USDWs are completely absent within the area of review. Examples of acceptable exemption criteria include:

- . The demonstrated absence of complex geologic structures such as faults; and
- . Accurate and detailed records confirm that no unplugged and abandoned or improperly plugged wells exist within the area of review; and
- . A sufficiently thick confining formation (e.g. 500 feet of clay or shale); and
- . The potentiometric surface of the injection zone will not exceed that of the lowest USDW at any time during the operating life of the facility.

Where the above criteria cannot be adequately demonstrated using existing data, direct measurement of vertical permeability of the confining system may be required.

JW:SG:jk/sp/1621f,1-47



217/782-6762

UIC Log 68

Refer to: 1838040027 -- Vermilion County  
Danville/Allied-Signal, Inc.  
USEPA #ILD005463344  
Permit #UIC-003-W1-AC  
UIC Administrative Record

April 22, 1988

Allied-Signal, Inc.  
ATTN: Don M. Phillips, Plant Mgr.  
Post Office Box 13  
Danville, Illinois 61834-0013

Allied-Signal, Inc.  
Post Office Box 1139R  
Morristown, New Jersey 07960

Gentlemen:

Enclosed is a revised draft Underground Injection Control (UIC) permit for waste disposal well WDW-1 and a fact sheet. The draft permit is based on the administrative record contained in the Agency's files. The contents of the administrative record are described in 35 Illinois Administrative Code (I.A.C.) Section 705.144.

Under the provisions of 35 I.A.C. 705.141(d), the draft permit and administrative record must be publicly noticed and made available for public comment. The Agency must also provide an opportunity for a public hearing. The Agency has scheduled a public hearing to be held at the Ramada Inn in Danville, Illinois on May 26, 1988 at 7:00 p.m. The public comment period will close on June 26, 1988.

During the comment period, the applicant or any interested party may submit comments to the Agency on only the conditions opened in the draft permit for WDW-1. At the close of the comment period, the Agency will prepare a response to significant comments.

The effective date of this permit will remain May 4, 1987. The Agency will issue a final permit after the close of public comment period. The applicant has 35 days after the effective date to petition the Illinois Pollution Control Board to contest the final permit decision. The appeal process and limitations are addressed in 35 I.A.C. 705.212.



Page 2

If you have any questions concerning this draft permit, please contact Steve Gobelman at 217/785-6871.

Very truly yours,

A handwritten signature in cursive script that reads "Lawrence W. Eastep".

Lawrence W. Eastep, P.E., Manager  
Permit Section  
Division of Land Pollution Control

LWE:SG:jas/1043j,1-2/sp

cc: Division File - Administrative Records UIC #68  
Compliance Section  
Central Region  
USEPA -- Region V, Lynn Crivello 5WD-TUB9  
ISGS -- Ross Brower  
ISWS -- Adrian Visocky  
Bill Radlinski  
Department of Mines and Minerals, Oil and Gas Division  
Steve Gobelman  
Gary King  
Ken E. Davis Associates  
USEPA -- Region V, Steve Burton 5WD-TUB9  
Barton Day

Fact SheetAllied-Signal Inc.  
Danville Facility

UIC Permit No. UIC-003-W1-AC  
For operation of a Class I Well No. WDW-1

This fact sheet has been prepared pursuant to the requirements of Section 705.143, Illinois Adm. Code 35. The fact sheet is intended to be a brief summary of the principal facts and significant factual, legal, methodological, and policy questions considered in preparing a draft permit.

Contacts:

Allied-Signal Inc.  
Attention: Don M. Phillips, Plant Manager  
Post Office Box 13  
Danville, Illinois 61834-0013

Allied-Signal Inc.  
Post Office Box 1139R  
Morristown, New Jersey 07960

Description of Facility and Background Information:

Allied-Signal Inc. at Danville, Illinois, is in the business of producing chlorofluorocarbons for use as refrigerent gases in coolers, chillers, and dispensing gases for a variety of other commercial uses. The plant also produces by-product hydrochloric acid. Allied-Signal Inc. at Danville, Illinois has been operating an industrial waste injection well of Class I type since 1973. The well will be operated at 446.19 feet north and 46.88 feet west of the SE corner of the SW quarter of the NW quarter of Section 12, Township 19 North, Range 11 West of the 2nd Principal Meridian, Vermilion County, Illinois.

The liquid waste to be injected into the Eminence, Potosi, and Upper Franconia Formations contains contaminated storm water, hydrochloric acid vent scrubber discharge, boiler blowdowns, cooling tower blowdowns, dilute waste caustic from a scrubber, hydrofluoric acid vent scrubber discharge, water softening equipment backflush, and product hydrochloric acid. This waste water is neutralized and stored at the facility in rubber lined steel and fiberglass storage tanks prior to injection. The waste is pumped from the tanks through one of two sets of polishing filters before being injected in the well.





UIC 003-W1-AC

Page 2

Type and Quantity of Waste:

The Allied-Signal Inc. will inject a maximum of 125 gallons per minute of liquid waste daily into the Eminence, Potosi, and Upper Franconia Formations. This waste will consist of the following key components and concentrations:

- |                              |                               |
|------------------------------|-------------------------------|
| a) Water                     | pH 5-10                       |
| b) Inorganic Chloride Salts  | 25,000 mg/l                   |
| c) Organic Material (T.O.C.) | 200 mg/l                      |
| d) Arsenic                   | Haz Waste Code #D004 500 mg/l |

Draft Permit Conditions:

The following is a summary of the conditions contained in the draft permit:

Well specifications provided in the permit condition A indicate the designation and well specification of the injection well. Also, the dates of the information used for the permit decision.

Condition B deals with the operating, monitoring, and reporting requirements that must be followed by the permittee during the life of the well. The operating requirements are given to prevent excessive pressure build up over the life of the well and to prevent any damage to the upper confining zone. The monitoring requirements are used to ensure compliance with the UIC regulations and this permit. Reporting requirements assure the Illinois Environmental Protection Agency will receive prompt notification when problems which may threaten the environment, occur and the Agency will be kept informed of normal well operations.

Conditions C through G deal with the effect of the permit, permit actions, severability, confidentiality, and penalties for violations, respectively.

Condition H contains the standard conditions required, by the regulations, for every facility. In addition, special conditions relating only to this facility have been added by the Agency to assure safe operation of the injection well. The mechanical integrity test of the well must demonstrate that the well will operate as designed. No injection can occur until mechanical integrity is met. Plugging and abandonment plan will be used for abandonment of the well at the end of its operating life.

PERMIT CONDITIONSBASIS

## A. WELL SPECIFICATION

- |                                      |                             |
|--------------------------------------|-----------------------------|
| 1. Well Location                     | Administrative Requirements |
| 2. Application and Plans             | 35 I.A.C. 702.160           |
| 3. Casing and Cementing              | 35 I.A.C. 730.112(b)        |
| 4. Tubing Specifications             | 35 I.A.C. 730.112(c)        |
| 5. Conductivity Rings                | 35 I.A.C. 702.160           |
| 6. Access During Logging and Testing | 35 I.A.C. 704.149           |
| 7. Blowout Preventer                 | 35 I.A.C. 702.160           |

## B. OPERATING, MONITORING AND REPORTING REQUIREMENTS

- |                                   |                      |
|-----------------------------------|----------------------|
| 1. Operating Requirements         | 35 I.A.C. 730.113(a) |
| 2. Monitoring Requirements        | 35 I.A.C. 730.113(b) |
| 3. Waste Analysis Plan            | 35 I.A.C. 704.187    |
| 4. Groundwater Monitoring Plan    | 35 I.A.C. 730.113(b) |
| 5. Monthly Reporting Requirements | 35 I.A.C. 730.113(c) |

C. EFFECT OF PERMIT	35 I.A.C. 704.122, 702.181, and Section 1431 of the Safe Drinking Water Act
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D. PERMIT ACTIONS	35 I.A.C. 702.146
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E. SEVERABILITY	35 I.A.C. 700.107
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F. CONFIDENTIALITY	Section 7 Environmental Protection Act
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G. PENALTIES FOR VIOLATION OF PERMIT	Safe Drinking Water Act and Environmental Protection Act
--------------------------------------	---

## H. DUTIES AND REQUIREMENTS

- |                    |                                  |
|--------------------|----------------------------------|
| 1. Duty to Comply  | 35 I.A.C. 702.141 and 704.181(a) |
| 2. Duty to Reapply | 35 I.A.C. 702.142                |



3. Need to Halt or Reduce Activity	35 I.A.C. 702.143
4. Duty to Mitigate	35 I.A.C. 702.144
5. Proper Operation and Maintenance	35 I.A.C. 702.145
6. Property Rights	35 I.A.C. 702.147
7. Duty to Provide Information	35 I.A.C. 702.148
8. Inspection and Entry	35 I.A.C. 702.149
9. Monitoring	35 I.A.C. 702.160
10. Records	35 I.A.C. 704.181(b) and 702.159(b)(c)
11. Signatory Requirements	35 I.A.C. 702.126 and 702.151
12. Reporting Requirements	35 I.A.C. 702.152(a)(b)(g) and 704.181(b)
13. Corrective Action Requirements	35 I.A.C. 704.193
14. Twenty-four Hour Reporting	35 I.A.C. 702.152(f)
15. Transfer of Permit	35 I.A.C. 702.152(c) and 702.182
16. Financial Responsibility	35 I.A.C. 704.189
17. Cost Estimate for Plugging and Abandonment	35 I.A.C. 704.212
18. Incapacity	35 I.A.C. 704.230
19. Revocation of Permits	35 I.A.C. 702.186
20. State Mining Board Permits	Rule II, Illinois Department of Mines and Minerals Rules and Regulations
21. False or Omitted Information	35 I.A.C. 702.152(h)
22. Restriction on Injected Substances	Hazardous well, Permit application, 35 I.A.C. 702.160
23. Plugging and Abandonment	35 I.A.C. 704.188



UIC 003-W1-AC  
Page 5

24. Conversion or Abandonment	35 I.A.C. 704.181(e)
25. Inactive Wells	35 I.A.C. 704.188
26. Mechanical Integrity	35 I.A.C. 704.190
27. Contingency Plan	35 I.A.C. 702.160
28. EP Toxicity	35 I.A.C. 702.160
29. Neutralization	35 I.A.C. 702.160
30. Section 39(h) Approval	35 I.A.C. 702.160
31. Continuing Releases at Permitted Facilities	Corrective Action Under §3004(u) of the Hazardous and Solid Waste Amendments of 1984
32. Restrictions on Future Land Use for Hazardous Facilities	35 I.A.C. 724.219 and 220

Conditions Changed in the Permit:

The Agency has received information from Allied-Signal Inc. to modify the Class I injection well permit #UIC-003-W1-AC. Allied-Signal Inc. has also submitted information supplementing the basis for the permit. This information includes the addition of data on water wells in proximity to its operation and clarifying the description and delineation of the injection and confining zones as identified in the original permit application. The Agency is currently reviewing the changes in description and delineation of the injection and confining zones as they relate to well construction and operation.

Because of the modification the permit is being reopened for public comment. According to 35 I.A.C. 705.184(d), comments filed during the reopened comment period shall be limited to the substantial new questions that caused its reopening. The following conditions in the permit are being changed as a major modification and are subject to public comment.

Condition

Changes

I.A.2.

More information was received and subsequently listed as March 20, 1987, May 26, 1987, March 28, 1988, and April 11, 1988.



UIC 003-W1-AC  
Page 6

I.A.5.

This condition was reworded to eliminate confusing language and to clarify that at least one set of conductivity rings must be operational at all times and that both sets of conductivity rings must be operational at the conclusion of any workover requiring tubing removal.

I.A.7.

A new condition was added that required Allied to install a permanent blowout preventer instead of installing a blowout preventer at the time of each mechanical integrity demonstration. If Allied has installed the blowout preventer prior to issuance of the final permit, this condition will be changed to maintain a blowout preventer.

I.B.1.b.

Wording was added to specify that the Permittee may seek a minor permit modification to increase injection rate if the range of the injection rate recorder exceeds the maximum injection rate sought by at least 20%.

I.B.1.c.

Allied-Signal now neutralizes its waste prior to injection. Accordingly, interim conditions intended to apply prior to operation of Allied's neutralization system have been deleted.

Total acidity (as HCl) was deleted as a parameter after neutralization because with a pH of 5 there will be no measurable percent acid left in the waste being injected.

Wording was added to allow excursion to the pH due to unintentional and temporary incidents but not to exceed a 60 minute period.

I.B.1.d.

A range in annulus pressure was added to allow fluctuation due to temperature effects on the annulus.



UIC 003-W1-AC  
Page 7

- I.B.1.g. The words "or smaller" were added to reflect that Allied can use a smaller filter size.
- I.B.2.b.iv. and vii. Changes reflect installation of pH recorder.
- I.B.3. The submittal date was changed to 45 days after the effective date of this modified permit.
- I.B.4. The submittal date was changed to 45 days after the effective date of this modified permit.
- I.B.5. The submittal date for monthly reports was changed from the 15th to the 28th.
- I.H.18. Wording was changed due to new regulation.
- I.H.26.a This condition was modified to allow Attachment B to be changed, with Agency approval, without a modification to this permit.
- I.H.26.c. This condition was changed to provide better coordination of periodic mechanical integrity testing requirements, and to clarify that temperature logs must be conducted without the injection tube in place.
- I.H.26.c.i, ii, iii, and iv Wording was deleted from the portion of the permit and inserted into Attachment B of this permit.
- I.H.26.h. Wording was added to require Allied to submit MIT procedures to Permit Section, Division of Land Pollution Control.
- I.H.26.k. Wording was changed to show that the Agency may require the permittee to conduct a demonstration of the mechanical integrity of the well when evidence reasonably indicates that the integrity of the well is in question.



UIC 003-W1-AC  
Page 8

I.H.28.	The submittal date was changed to 30 days after the effective date of this modified permit.
I.H.29	This condition was changed to reflect the installation of the neutralization system.
Attachment B	Procedures for running the temperature log and radioactive tracer survey were added.
Attachment D	Waste frequency was changed to analytical frequency.  Changes reflect installation of neutralization system and changes in parameters to more accurately characterize the injected waste.
Attachment E	Wording change to reflect how the permittee will calculate average values.
Attachment F	Wording change from indications of a possible to circumstances that reasonably indicate a potential for well failure.
Attachment G	Changes reflect installation of neutralization system, pH recorder, and conforming changes.
Attachment H	Conforming schedule change.
The following conditions in the permit are being changed as a minor modification and are not subject to public comment.	
Entire permit	Change Allied Corporation to Allied-Signal Inc.
I.B.2.c.	The word maximum was added.
I.B.5.e.	The words Groundwater Section (Deep Well Disposal) were added to Illinois State Geological Survey and Water Survey address.
Attachment F	The injection rate was changed from 120 gpm to 125 gpm.



UIC 003-W1-AC  
Page 9

Procedures for Reaching a Final Decision

The public comment period is from April 25, 1988 to June 26, 1988. During this period any interested person may submit written comments on the Draft Permit at the following address:

Illinois Environmental Protection Agency  
Government & Community Affairs Section, Director's Office  
Attention: Public Notice Clerk  
2200 Churchill Road  
Post Office Box 19276  
Springfield, Illinois 62794-9276

The administrative record is open for public inspection at the IEPA's Springfield headquarters from 8:30 a.m. to 5:00 p.m., Monday through Friday. The administrative record contains the permit application, fact sheet and other supporting documents and correspondence submitted to the IEPA. Inspections of the administrative record must be scheduled in advance by contacting the Public Notice Clerk at the above address or at 217/782-5562.

For further information, please contact Robert D. Rosen, Director's Office, Illinois Environmental Protection Agency at 2200 Churchill Road, Post Office Box 19276, Springfield, Illinois 62794-9276 or by phone at 217/782-5562.

SG:jk/sp/1621f,1-9





217/782-6762

UIC Log 68

## Hazardous Waste Class I Well

DRAFT

Underground Injection Control Permit: Well No. 1

Refer to: IEPA #1838040027 - Vermilion County      Issued Date: March 30, 1987  
Danville/Allied-Signal, Inc.      Effective Date May 4, 1987  
USEPA #ILD005463344      Expiration Date May 4, 1991  
Permit #UIC-003-W1-AC  
UIC-Administrative Record      Modification Date May 5, 1987

Allied-Signal, Inc.  
ATTN: Don M. Phillips, Plant Mgr.  
Post Office Box 13  
Danville, Illinois 61834-0013

Allied-Signal, Inc.  
Post Office Box 1139R  
Morristown, New Jersey 07960

A draft permit is hereby proposed pursuant to the Illinois Environmental Protection Act and Title 35 Illinois Administrative Code (I.A.C.) Parts 702, 704, 705, and 730 to the Allied-Signal, Inc. to maintain and operate an Underground Injection Control Well No. 1 for the injection of hazardous waste consisting of a maximum of 125 gallons per minute (gpm) of contaminated stormwater, hydrochloric acid vent scrubber discharge, boiler blowdowns, cooling tower blowdowns, dilute waste caustic from a scrubber, hydrofluoric acid vent scrubber discharge, water softening equipment backflush, and by-product hydrochloric acid into the Emmence, Postosi, and Upper Franconia Formation. All wastes are neutralized prior to injection. The Allied-Signal, Inc. well is located at 446.19 feet north and 46.88 feet west of the SE corner of the SW quarter of the NW quarter of Section 12, Township 19 North, Range 11 West of the 2nd Principal Meridian, Vermilion County, Illinois.

This draft permit consists of the conditions contained herein (including those in any attachments and appendices) and applicable regulations contained in the Illinois Environmental Protection Act and Title 35 I.A.C. Parts 702, 704, 705, and 730. The Environmental Protection Act (Ill. Rev. Stat., Chapter 111 1/2, Section 1039) grants the Illinois Environmental Protection Agency the authority to impose conditions on permits which it issues. This Permit contains 37 pages including Attachments A through H.

If you have any questions regarding this final permit, please contact Steve Gobelman at 217/785-6871.

Very truly yours,

Lawrence W. Eastep, P.E., Manager  
Permit Section  
Division of Land Pollution Control

LWE:SG:jas/1042j,1/sp



## TABLE OF CONTENTS

	<u>Page No.</u>
I. PERMIT CONDITIONS	
A. WELL SPECIFICATION .....	1
1. Well Location .....	1
2. Application and Plans .....	1
3. Casing and Cementing .....	1
4. Tubing Specifications .....	2
5. Conductivity Rings .....	2
6. Access During Logging and Testing .....	2
7. Blowout Preventer .....	2
B. OPERATING, MONITORING, AND REPORTING REQUIREMENTS .....	2
1. Operating Requirements .....	2
2. Monitoring Requirements .....	4
3. Waste Analysis Plan .....	4
4. Groundwater Monitoring Plan .....	5
5. Monthly Reporting Requirements .....	5
C. EFFECT OF PERMIT .....	7
D. PERMIT ACTIONS .....	8
E. SEVERABILITY .....	8
F. CONFIDENTIALITY .....	8
G. PENALTIES FOR VIOLATION OF PERMIT .....	8
H. DUTIES AND REQUIREMENTS .....	9
1. Duty to Comply .....	9
2. Duty to Reapply .....	9
3. Need to Halt or Reduce Activity .....	9
4. Duty to Mitigate .....	9
5. Proper Operation and Maintenance .....	9
6. Property Rights .....	9
7. Duty to Provide Information .....	10
8. Inspection and Entry .....	10
9. Monitoring .....	10
10. Records .....	10
11. Signatory Requirements .....	11
12. Reporting Requirements .....	11
13. Corrective Action Requirements .....	12
14. Twenty-four Hour Reporting .....	12
15. Transfer of Permit .....	13
16. Financial Responsibility .....	13
17. Cost Estimate for Plugging and Abandonment .....	14
18. Incapacity .....	14
19. Revocation of Permits .....	15
20. State Mining Board Permits .....	15
21. False or Omitted Information .....	15



Page No.

22. Restriction on Unpermitted Waste .....	16
23. Plugging and Abandonment .....	16
24. Conversion or Abandonment .....	16
25. Inactive Wells .....	17
26. Mechanical Integrity .....	17
27. Contingency Plan .....	18
28. EP Toxicity .....	18
29. Neutralization .....	19
30. Section 39(h) Approval .....	19
31. Continuing Releases at Permitted Facilities .....	19
32. Restrictions on Future Land Use for Hazardous Facilities .....	19

II. ATTACHMENTS

A.. PROCEDURE FOR PLUGGING AND ABANDONMENT OF WASTE DISPOSAL #1 .....	21
B. PROCEDURE USED FOR MECHANICAL INTEGRITY .....	23
C. WELL DIAGRAM .....	27
D. CHEMICAL PARAMETERS FOR MONITORING PROGRAM .....	29
E. PROCEDURE FOR CALCULATING AVERAGE VALUES .....	30
F. PROCEDURE FOR WELL FAILURE OR EQUIPMENT FAILURE .....	31
G. SUMMARY OF SUBMITTAL DATES .....	33
H. GROUNDWATER MONITORING PLAN .....	35



## DRAFT PERMIT

UIC-003-W1-AC

I. PERMIT CONDITIONS

## A. WELL SPECIFICATION

1. Well Location. The injection well WDW-1 shall be operated at 446.19 feet north and 46.88 feet west of the SE corner of the SW quarter of the NW quarter of Section 12, Township 19 North, Range 11 West of the 2nd Principal Meridian, Vermilion County, Illinois. The completed depth of the well is at 3613 feet or 2965 feet below Mean Sea Level.
2. Application and Plans. Well operation shall be conducted in accordance with the approved permit application and plans prepared by Allied-Signal Inc. and Ken E. Davis Associates consisting of:

<u>Pages</u>	<u>Date</u>	<u>Date Received</u>
237	June 17, 1985	June 20, 1985
21	October 1985	November 25, 1985
88	May 23, 1986	May 27, 1986
7	June 13, 1986	June 18, 1986
24	September 12, 1986	September 16, 1986
4	December 17, 1986	December 17, 1986
49	December 17, 1986	December 17, 1986
124	January 12, 1987	January 14, 1987
9	March 20, 1987	March 24, 1987
23	March 24, 1987	March 25, 1987
51	May 26, 1987	May 27, 1987
10	April 8, 1988	April 11, 1988

3. Casing and Cementing. The injection well, WDW #1, is cased and cemented to prevent the movement of fluids into or between underground sources of drinking water. The casing and cement used in the construction of the well are shown in Attachment C. (35 I.A.C. 730.112(b))
  - a. Surface Casing. Surface casing is set and cemented to a subsurface depth of 224 feet. Cementing was accomplished with 10.92 cubic yards of regular cement with 3% calcium chloride additive cement. The pump and plug cementing method was used to seal the well bore and fill the annular space between the hole and casing to the surface of the ground.
  - b. Intermediate casings. The bottom of the intermediate casing strings are set at 2773 feet and 3600 feet and cemented with pozmix resin cement with 18% salt and 4% gel additives using the pump and plug method. The casing set at 2773 feet casing is cemented to the surface and the casing set at 3600 feet casing is cemented to a



DRAFT PERMIT

UIC-003-W1-AC

depth of 1870 feet below the Kelley bushing and filled with kerosene to the surface as indicated in Attachment C.

- c. Longstring Casing. Long string casing is set to the top of the disposal zone, at approximately 3613 feet, and cemented with Epseal cement using the pump and plug method.
4. Tubing Specifications. Injection will only be through the 2 7/8 inch OD (outer diameter) fibercast tubing between 0 and approximately 3343 feet and through 2 3/8 inch OD fibercast tubing approximately between 3345 and 3670 feet. Tubing specifications are contained in Attachment C of this permit. Any changes in the tubing material and design shall be submitted to the Permit Section, Division of Land Pollution Control for approval at least 30 days prior to installation. (35 I.A.C. 730.112(b))
5. Conductivity Rings. Except as noted below, two sets of conductivity rings shall be maintained at all times. Sets of conductivity rings shall be set at approximately 3575 feet and the upper set at approximately 3560 feet. A minimum of two wires shall be attached to each conductivity ring so that the permittee can monitor the continuity of the electrode system. If either set of rings fails, the failing set shall be repaired during the next scheduled mechanical integrity test; provided, however, that the well shall not be operated unless one set of rings is in operation.
6. Access During Logging and Testing. The Agency and Illinois State Water and Geological Surveys will be given access to witness the running of any logs or tests. (35 I.A.C. 702.149)
7. Blowout Preventer. A permanent blowout preventer shall be installed at the wellhead at the time of the first scheduled mechanical integrity test conducted pursuant to this permit that requires pulling of the tubing currently scheduled for fall of 1988.

B. OPERATING, MONITORING AND REPORTING REQUIREMENTS

1. Operating Requirements (35 I.A.C. 730.113(a))
  - a. Maximum injection pressure. The maximum injection pressure at the wellhead shall not exceed 100 psig.
  - b. Maximum injection rate. The maximum injection rate shall not exceed 125 gpm. Permittee may seek a minor modification to this permit to allow an increase in the maximum injection rate upon installation of an injection rate recorder which ensures that the range exceeds 20% of the maximum injection rate.



## DRAFT PERMIT

UIC-003-W1-AC

- c. Waste Parameters. The injected waste shall not exceed the maximum limits of the parameters indicated below.

<u>Parameters</u>	<u>Haz Waste Code</u>	<u>Range or Maximum Limit</u>
Total Organic Carbon (TOC)		200 mg/l
Arsenic	D004	500 mg/l
pH		5-10*

\*Excursions\*\* from the pH range of 5-10 are permitted subject to the following limitations:

- 1) the total time during which the pH values are outside the required range of pH values shall not exceed 7 hours and 26 minutes in any calendar month and
- 2) no individual excursion from the range of pH values shall exceed 60 minutes.

\*\* For purposes of this permit, an excursion is an unintentional and temporary incident in which the pH value of injected waste water exceeds the range set forward in the permit.

- d. Annulus Protection. The annulus between the tubing and the long string of casings and the annulus between the 9 5/8 inch and 7 inch casing shall be filled with kerosene. A pressure of  $235 \pm 20$  psig shall be maintained on the inner annulus. A pressure  $65 \pm 15$  psig shall be maintained on the 9 5/8 inch and 7 inch annulus.
- e. Annulus injection prohibition. Injection between the outer most casing, protecting underground sources of drinking water, and the well bore is prohibited.
- f. Prohibition of excessive pressure. Except during stimulation, injection pressure at the wellhead shall not exceed a maximum which shall be calculated so as to assure that pressure in the injection zone during injection does not cause:
- i. initiation of new fractures or propagate existing fractures in the injection zone,
  - ii. initiation of fractures in the confining zone,
  - iii. migration of injected fluids into any underground source of drinking water,



- iv. displacement of formation fluid into any underground source of drinking water, or
  - v. non-compliance with 35 I.A.C. 730 operating requirements.
- g. Filtration. All waste that is injected into the well shall be filtered through a 100 micron or smaller particle filter.
2. Monitoring Requirements (35 I.A.C. 730.113(b))
- a. Sampling. The injection waste shall be sampled and monitored at the wellhead and shall be analyzed at the frequency specified in Attachment D. The pH and temperature shall be measured at the time the sample for specific gravity is taken and used when the sample is analyzed.
  - b. Continuous recording devices. The following continuous recording devices or their equivalents are used to monitor the injection pressure, flow rate, pH, temperature, and annulus pressure:
    - i. Injection pressure gauges - Foxboro Model 40 recorder.
    - ii. Casing-tubing annulus pressure gauges - Foxboro Model 40 recorder.
    - iii. Flow meters - Foxboro Model 40 recorder and Foxboro 2803-SABA-DB recorder.
    - iv. pH recording device - Foxboro 40 PR-RFE3F-ESA21AN recorder on a 7 day rotational chart.
    - v. Temperature - Safecare PG-73 nonrecorder.
    - vi. Annulus conductivity and cable continuity - Easterline Angus MRL Multipoint Recorder/Logger.
  - c. Recording device ranges. All recording devices, except pH recorders, will exceed maximum operating ranges by 20%.
3. Waste Analysis Plan (35 I.A.C. 704.187)

The Permittee shall develop and follow a written Waste Analysis Plan which describes the procedures which will be carried out to comply with Permit Conditions for sampling in the Monitoring Requirements of Condition B2a. This plan shall be submitted to the Permit Section, Division of Land Pollution Control for approval within forty-five (45) days after the effective date of



this modified permit and a copy of the plan shall be kept at the facility. At a minimum, the plan must specify:

- a. The parameters for which each hazardous waste will be analyzed and the rationale for the selection of these parameters;
  - b. The test methods which will be used to test for these parameters; and
  - c. The sampling method which will be used to obtain a representative sample of the waste to be analyzed and the frequency of sampling and analysis for each parameter.
  - d. Sample preservation. Organic sampling and analytical procedures consistent with the "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods" (SW-846) shall be incorporated in the waste analysis plan.
  - e. Sampling methods for monitoring wells will also be addressed in the Waste Analysis Plan.
4. Groundwater Monitoring Plan. The Permittee shall submit a Groundwater Monitoring Plan to the Permit Section, Division of Land Pollution Control no later than forty-five (45) days after the effective date of this modified permit. This plan will be designed to detect any migration of fluids into and pressure build-up in the Underground Sources of Drinking Water (USDWs) and/or aquifers containing less than 10,000 mg/l of total dissolved solids (TDS). This plan should also include the parameters to be measured and the frequency of monitoring. The elements of an acceptable Groundwater Monitoring Plan are set forth in Attachment H. The time for submission may be extended for good cause if the Agency receives a request before the expiration of the forty-five (45) day period and said request demonstrates the need for an extension. The Permittee may request waiver of this requirement within forty-five (45) days of the effective date of this modified permit if it can be demonstrated that there is no potential for fluid movement above the confining zone caused by injection activity or that USDWs are completely absent within the area of review. Upon approval of the Groundwater Monitoring Plan, or waiver of the ground water monitoring requirements, the plan or waiver will be incorporated into this permit as Attachment H. All extensions or waivers granted must be in writing. (35 I.A.C. 730.113)
5. Monthly Reporting Requirements
- a. Report submittal date. Monthly monitoring reports are due by the 28th day of the month immediately following the





reporting period. A reporting period is defined as a calendar month.

- b. Contents of monthly reports. The monthly reports shall include:
  - i. Daily value for total volume and daily maximum, minimum, and average values for annulus pressure, injection pressure, and flow rate, using the procedure in Attachment E.
  - ii. The number of start ups during each day.
  - iii. Total gallons injected to date.
  - iv. Monthly summary of:
    - (a) maximum, minimum, and average values for annulus pressure, injection pressures and flow rate using the procedure in Attachment E.
    - (b) total volume.
    - (c) total number of well startups.
  - v. Operating charts for the month submitted on 7 day circular charts for:
    - (a) annulus pressure
    - (b) injection pressure
    - (c) flow rate
  - vi. Results of chemical analyses required by this permit.
  - vii. A copy of the annulus conductivity and cable continuity recording charts.
- c. Other information in monthly reports. The results of any of the following tests or work shall be reported with the second monthly report after completion of the test or work:
  - i. Periodic tests of mechanical integrity.
  - ii. Copies of any logs run on the well submitted with a log analysis.
  - iii. Any other test conducted on the injection well.



- iv. Any well work over.
- v. Maintenance performed on monitoring devices or well components.
- vi. Changes of gauges, pipes, and other well components and monitoring devices.
- d. Illegible reports will be returned to the Permittee and deemed not filed. All graphs and charts will be labeled appropriately.
- e. Report submittal addresses.

One copy of the monthly reports will be submitted to each of the following addresses:

- i. Illinois Environmental Protection Agency  
Division of Land Pollution Control - #24  
Compliance Section  
2200 Churchill Road  
P.O. Box 19276  
Springfield, Illinois 62794-9276
- ii. Illinois Environmental Protection Agency  
Division of Land Pollution Control  
Field Operations Section  
4500 South 6th Street  
Springfield, Illinois 62706
- iii. Illinois State Geological Survey  
Groundwater Section (Deep Well Disposal)  
Attention: Mr. Ross Brower  
615 East Peabody Drive  
Champaign, Illinois 61820
- iv. Illinois State Water Survey  
Ground Water Section (Deep Well Disposal)  
Attention: Mr. Adrian Visocky  
2204 Griffith Drive  
Champaign, Illinois 61820

- C. EFFECT OF PERMIT. The existence of a UIC permit shall not constitute a defense to a violation of the Environmental Protection Act, or Subtitle G except for development, modification, or operation without a permit. A permit may be modified or revoked during its term for cause set forth in 35 I.A.C. 702.183 through 701.186. (35 I.A.C. 702.181)



The Permittee is allowed to engage in underground injection in accordance with the conditions of this permit. The underground injection activity, authorized by this permit shall not allow the movement of fluid containing any contaminant into underground sources of drinking water, if the presence of that contaminant may cause a violation of any primary drinking water regulation under 40 CFR Part 142 or may otherwise adversely affect the health of persons or the environment. Any underground injection activity not authorized in this permit is prohibited. (35 I.A.C. 704.122)

Compliance with the terms of this permit does not constitute a defense to any action brought under Section 1431 of the Safe Drinking Water Act (SDWA) or any other law governing protection of public health or the environment for any imminent and substantial endangerment to human health, or the environment. In the case of disagreement between the conditions of this permit and the application, the permit conditions shall govern.

- D. PERMIT ACTIONS. This permit may be modified or revoked for cause as specified in 35 I.A.C. 702.183 through 702.187. The filing of a request by the Permittee for a permit modification or revocation, or a notification of planned changes or anticipated noncompliance, does not stay the applicability or enforceability of any permit condition. (35 I.A.C. 702.146)
- E. SEVERABILITY. The provisions of this permit are severable, and if any provision of this permit, or the application of any provision of this permit is held invalid, the application of such provision to other circumstances, and to the remaining provisions of this permit shall not be affected thereby. (35 I.A.C. 700.107)
- F. CONFIDENTIALITY. In accordance with Section 7 of the Environmental Protection Act, certain information submitted to the Agency pursuant to this permit may be claimed as confidential by the submitter. Any such claim must be asserted at the time of submission by stamping the words "confidential business information" on each page containing such information. If no claim is made at the time of submission, Agency may make the information available to the public without further notice. If a claim is asserted, the validity of the claim will be assessed in accordance with the Board and Agency procedures. Claims of confidentiality for the following information will be denied:
1. The name and address of the Permittee;
  2. Information which deals with the existence, absence or level of contaminants in drinking water.
- G. PENALTIES FOR VIOLATIONS OF PERMIT CONDITIONS. Any person who violates a permit requirement is subject to civil penalties, fines,



## DRAFT PERMIT

UIC-003-W1-AC

and other enforcement action under SDWA and the Environmental Protection Act.

## H. DUTIES AND REQUIREMENTS

1. Duty to Comply. The Permittee shall comply with all applicable Underground Injection Control (UIC) program regulations and conditions of this permit, except to the extent and for the duration such noncompliance is authorized by a temporary emergency permit under 35 I.A.C. 704.163. Any permit noncompliance constitutes a violation of the Illinois Environmental Protection Act and is grounds for enforcement action, permit revocation, modification, or denial of a permit renewal application. Such noncompliance may also be grounds for enforcement action under the Resource Conservation and Recovery Act (RCRA). (35 I.A.C. 702.141 and 35 I.A.C. 704.181(a))
2. Duty to Reapply. If the Permittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the Permittee must submit an application for a new permit at least 180 days before this permit expires. (35 I.A.C. 702.142)
3. Need to Halt or Reduce Activity. It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit. (35 I.A.C. 702.143)
4. Duty to Mitigate. The Permittee shall take all reasonable steps to minimize or correct any adverse impact on the environment resulting from non-compliance with this permit. (35 I.A.C. 702.144)
5. Proper Operation and Maintenance. The Permittee shall at all times properly operate and maintain all facilities, systems of treatment, and controls (and related appurtenances) which are installed or used by the Permittee to achieve compliance with the conditions of this permit. Proper operation and maintenance includes effective performance, adequate funding, adequate operator staffing and training, adequate laboratory and process controls, and appropriate quality assurance procedures. This provision requires the operation of backups, auxiliary facilities, or similar systems used only when necessary to achieve compliance with the condition of the permit. (35 I.A.C. 702.145)
6. Property Rights. Issuance of this permit does not convey any property rights of any sort, or any exclusive privilege. (35 I.A.C. 702.147)



7. Duty to Provide Information. The Permittee shall furnish to the Agency, within the specified times, any information which the Agency may request, to determine whether cause exists for modifying, revoking and reissuing, terminating this permit, or to determine compliance with this permit. The Permittee shall also furnish to the Agency, upon request, copies of records required to be kept by this permit. (35 I.A.C. 702.148)
8. Inspection and Entry. The Permittee shall allow an authorized representative of the Agency, upon the presentation of credentials and other documents as may be required by law, and at reasonable times to:
  - a. Enter upon the Permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit;
  - b. Have access to and copy any records that must be kept under the conditions of this permit;
  - c. Inspect any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; and
  - d. Sample or monitor for the purposes of assuring permit compliance or as otherwise authorized by the appropriate Act, any substances or parameters at any location. (35 I.A.C. 702.149)
9. Monitoring. Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity. (35 I.A.C. 702.150(a))
10. Records. (35 I.A.C. 702.150(b), (c) and 704.181(b))
  - a. The Permittee shall retain records of all monitoring information, including all calibration, maintenance records, original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least 3 years from the date of the sample, measurement, report, or application. This period may be extended by request of the Agency at any time.
  - b. Retention of records. The Permittee shall retain records concerning the nature and composition of all injected fluids until three years after the completion of any plugging and abandonment procedures specified under 35 I.A.C. 704.188. The Owner or Operator shall continue to



retain the records after the three year retention period unless the owner or operator delivers the records to the Agency or obtains written approval from the Agency to discard the records.

- c. Records of monitoring information shall include:
  - i. The date, exact place, and time of sampling or measurements;
  - ii. The individual(s) who performed the sampling or measurements;
  - iii. A precise description sampling methodology and handling;
  - iv. The date(s) analyses were performed;
  - v. The individual(s) who performed the analyses;
  - vi. The analytical techniques or methods used; and
  - vii. The results of such analyses.

11. Signatory Requirements. All reports, or information submitted to the Agency shall be signed and certified as required in 35 I.A.C. 702.126. (35 I.A.C. 702.151)

12. Reporting Requirements.

- a. Planned changes. The Permittee shall give written notice to the Agency within 15 days of any planned physical alterations or additions to the permitted facility. (35 I.A.C. 702.152(a))
- b. Anticipated noncompliance. The Permittee shall give advance notice to the Compliance Section, Division of Land Pollution Control of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements. (35 I.A.C. 702.152(b)).
- c. Other noncompliance. The Permittee shall report all instances of noncompliance not reported under 35 I.A.C. 702.152 paragraphs (d), (e) and (f) at the time monitoring reports are submitted. The reports shall contain the information referenced in 35 I.A.C. 702.152 subsection (f). (35 I.A.C. 702.152(g))
- d. A summary of the reporting dates can be found in Attachment G for all information required by this permit.



13. Corrective Action Requirements

- a. The permitted well will be immediately shut-in and the Compliance Section, Division of Land Pollution Control will be notified if:
  - i. upward fluid migration occurs through the well bore of any unknown, improperly, or unplugged well(s) due to injection of permitted fluid and/or
  - ii. any problems developed with the casing of the injection well.
- b. The improperly plugged or unplugged well(s) will then be plugged and abandoned immediately. A copy of the plugging affidavit(s) filed with the Oil and Gas Division, Illinois Department of Mines and Minerals must be submitted to the Compliance Monitoring Section, Division of Land Pollution Control.
- c. Telephone notification within twenty-four (24) hours of the discovery of the problem and written confirmation transmitted by letter within five (5) days.
- d. In case of well failure the procedures in Attachment F will be followed. An investigation of the indicated well failure and plan of action to eliminate the problem must be conducted and the remedial work performed.

14. Twenty-four Hour Reporting.

- a. The Permittee shall report to the Compliance Section, Division of Land Pollution Control any noncompliance which may endanger health or the environment. Any information shall be provided orally within 24 hours from the time the Permittee becomes aware of the circumstances.
- b. A written submission shall also be provided to the Compliance Section, Division of Land Pollution Control within 5 days of the time the Permittee becomes aware of the circumstances. The written submission shall contain:
  - i. a description of the noncompliance and its cause;
  - ii. the period of noncompliance, including exact dates and times;
  - iii. if the noncompliance has not been corrected, the anticipated time it is expected to continue; and



- iv. steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance. (35 I.A.C. 702.152(f))
  - c. The following shall be included as information which must be reported within 24 hours (35 I.A.C. 704.181(d)):
    - i. Any monitoring or other information which indicates any contaminant may cause an endangerment to underground sources of drinking water.
    - ii. Any noncompliance with a permit condition or malfunction of the injection system which may cause fluid migration into or between underground sources of drinking water.
- 15. Transfer of Permit.
  - a. Transfers. This permit is not transferable to any person except after notice to the Permit Section, Division of Land Pollution Control. The Agency may require modification of the permit to change the name of the Permittee and incorporate such other requirements as may be necessary under the appropriate Act. (35 I.A.C. 702.152(c))
  - b. Transfer by modification. A permit may be transferred by the Permittee to a new owner or operator only if the permit has been modified (under 702.183 through 185), reissued, or a minor modification made (under Section 702.187(d)), to identify the new permittee and incorporate such other requirements as may be necessary under the appropriate Act. The new owner or operator to whom the permit is transferred shall comply with all the terms and conditions specified in such permit. (35 I.A.C. 702.182(a))
- 16. Financial Responsibility. (35 I.A.C. 704.189) The Permittee will maintain financial responsibility and resources to close, plug, and abandon the underground injection wells in a manner prescribed by the Agency, and described in Attachment A.
  - a. The Permittee must show evidence of financial responsibility to the Permit Section, Division of Land Pollution Control by the submission of a surety bond, other adequate assurance such as financial statements, or other materials acceptable to the Agency.
  - b. The financial documents submitted must be revised and maintained as specified in 35 I.A.C. 704 and 40 CFR 144.



**17. Cost Estimates for Plugging and Abandonment. (35 I.A.C. 704.212)**

- a. The owner or operator will maintain a written estimate, in current dollars, of the cost of plugging the injection well in accordance with the plugging and abandonment procedure (Attachment A). The cost estimate must equal the cost of plugging and abandonment at the point in the facility's operating life when the extent and manner of its operation would make plugging and abandonment the most expensive, as indicated by its plan.
- b. The owner or operator must adjust the cost estimate for inflation within 30 days after each anniversary of the date on which the first cost estimate was prepared. The adjustment must be made as specified in paragraphs (i) and (ii) of this condition, using an inflation factor derived from the annual Oil and Gas Field Equipment Cost Index. The inflation factor is the result of dividing the latest published annual Index by the Index for the previous year.
  - i. The first adjustment is made by multiplying the cost estimate by the inflation factor. The result is the adjusted cost estimate.
  - ii. Subsequent adjustments are made by multiplying the latest adjusted cost estimate by the latest inflation factor.
- c. The owner or operator must review the cost estimate whenever a change in the plan increases the cost of plugging and abandonment. The revised cost estimate must be adjusted for inflation as specified in paragraph (b).
- d. The owner or operator must keep the following at the facility during the operating life of the facility:
  - i. the latest cost estimate prepared in accordance with paragraphs (a) and (c) and,
  - ii. the latest adjusted cost estimate prepared in accordance with paragraph (b). (35 I.A.C. 704.212)

**18. Incapacity (35 I.A.C. 704.230)**

- a. An owner or operator shall notify the Agency by certified mail of the commencement of a voluntary or involuntary proceeding under 11 U.S.C. (Bankruptcy), naming the owner or operator as debtor, within 10 business days after the commencement of the proceeding. A guarantor of a corporate guarantee as specified in 35 I.A.C. 704.219 must make such



- a notification if the guarantor is named as debtor, as required under the terms of guarantee in 35 I.A.C. 704.240.
- b. An owner or operator who fulfills the requirements of 35 I.A.C. 704.213 by obtaining a letter of credit, surety bond or insurance policy will be deemed to be without the required financial assurance in the event of bankruptcy, insolvency or a suspension or revocation of the license or charter of the issuing institution. The owner or operator must establish other financial assurance within 60 days after such event.
19. Revocation of Permits. (35 I.A.C. 702.186) The Illinois Pollution Control Board will revoke a permit during its term in accordance with Title VIII of the Illinois Environmental Protection Act or the Agency will deny permit renewal for the following causes:
- a. The Permittee's violation of the Environmental Protection Act or regulations adopted thereunder;
- b. Noncompliance by the Permittee with any condition of the permit;
- c. The Permittee's failure in the application or during the permit issuance process, to disclose fully all relevant facts, or the Permittee's misrepresentation of any relevant facts at any time; or
- d. A determination that the permitted activity endangers human health or the environment and can only be regulated to acceptable levels by permit modification or revocation.
20. State Mining Board Permits. Issuance of this permit does not relieve the Permittee of the responsibility of complying with the provisions of Illinois State Mining Board Rules and Regulations and an Act in Relation to Oil, Gas, Coal, and Other Surface and Underground Resources. (Rule II, Illinois Department of Mines and Minerals Rules and Regulations)
21. False or Omitted Information.
- a. The Permittee shall not make any false statement, representation, or certification in any application, record, report, plan, or other document submitted to the Agency, the United States Environmental Protection Agency (USEPA), or required to be maintained under this permit.
- b. If or when the Permittee becomes aware that they failed to submit any relevant information in a permit application or



incorrect information was submitted in a permit application or in any report to the Agency, the Permittee shall promptly submit such facts or correct information to the Permit Section, Division of Land Pollution Control within ten (10) days. (35 I.A.C. 702.152(h))

22. Restriction on Unpermitted Waste. No waste other than those noted in this permit shall be injected. The Permittee shall submit, on January 15 of each year, a certified statement attesting compliance with this requirement for the previous calendar year. (35 I.A.C. 702.160)
23. Plugging and Abandonment.
  - a. The Permittee will plug and abandon the injection well in accordance with the schedule and provisions of the approved plugging and abandonment plan herein incorporated as Attachment A. (35 I.A.C. 702.188)
  - b. No later than thirty (30) days after plugging and abandonment the Permittee will submit a report to the Compliance Section, Division of Land Pollution Control. The report shall be certified as accurate by the person who performed the plugging operation, and will consist of:
    - i. A statement that the well was plugged in accordance with the plan most recently submitted to the Agency; or
    - ii. A statement defining the actual plugging and explaining why the Agency should approve such deviation, if the actual plugging differed from the approved plan. Any deviation from a previously approved plan which may endanger underground sources of drinking water is cause for the Agency to require the operator to replug the well; and
    - iii. Copy of well plugging affidavit submitted to Illinois Department of Mines and Minerals.
  - c. If the approved plugging and abandonment plan should change, a revised plan shall be submitted to the Permit Section, Division of Land Pollution Control for approval at the time of the next monthly report. Once approved, the revised plugging and abandonment plan will replace Attachment A and become as part of this permit as a minor modification.
24. Conversion or Abandonment. The Permittee will notify the Permit Section, Division of Land Pollution Control 45 days prior to conversion or abandonment of the wells. Any modification to the



plugging and abandonment or conversion found in Attachment A must be submitted for approval 180 days prior to actual conversion or abandonment. (35 I.A.C. 704.181(e))

25. Inactive Wells. (35 I.A.C. 704.188) After cessation of injection for two (2) years the Permittee will plug and abandon the well in accordance with Attachment A of this permit and 35 I.A.C. 730.110 unless the Permittee has:
  - a. Provided notice to the Compliance Section, Division of Land Pollution Control; and
  - b. Described actions or procedures, which are deemed satisfactory by the Agency, to ensure the well will not endanger underground sources of drinking water during the period of temporary abandonment. These actions and procedures shall include compliance with the technical requirements applicable to active injection wells, including mechanical integrity testing, unless waived by the Agency in writing.
26. Mechanical Integrity. (35 I.A.C. 704.190)
  - a. A demonstration of mechanical integrity will be conducted to ensure the well has integrity during the life of this permit. A descriptive report interpreting the results will be submitted with log analyses to the Compliance Section, Division of Land Pollution Control by an independent Log Analyst. The procedures specified in Attachment B of this permit will apply unless Allied-Signal Inc., submits and the Agency approves alternative mechanical integrity testing procedures.
  - b. The Permittee will demonstrate the absence of significant leaks in the casing or injection tubing by use of a pressure test and surface tubing pressure test to be conducted bi-annually.
  - c. The Permittee will demonstrate the absence of significant fluid movement into an underground source of drinking water through vertical channels adjacent to the injection well bore by use of a bi-annual temperature log of the casing and an annual radioactive tracer survey run through the tubing.
  - d. The Permittee will demonstrate, on a quarterly basis, the integrity of the electrode system.
  - e. Additional Mechanical Testing. In addition to a pressure test, temperature log, and radioactive tracer survey, the



Permittee will inform the Compliance Section, Division of Land Pollution Control of any additional mechanical integrity test, logs, or inspections at least thirty (30) days prior to the demonstration of mechanical integrity.

- f. A cement bond/evaluation log will be run in the entire length of the long string casing at least once every four years.
  - g. A casing inspection log will be run with the cement bond log to determine the thickness and condition of the long string casing.
  - h. The Permittee will notify the Compliance and Permit Sections, Division of Land Pollution Control of their intent to demonstrate mechanical integrity at least thirty (30) days prior to a demonstration. The type and exact procedures for each test must be specified in the notice.
  - i. The Permittee will cease injection if a loss of mechanical integrity as defined by 35 I.A.C. 730.108, or Attachment B of this permit, becomes evident during operation or at the time of the mechanical integrity demonstration. Operation will not be resumed until the Permittee has complied with the provisions of this permit regarding mechanical integrity demonstration and testing.
  - j. Gauge Calibration. All gauges used in mechanical integrity demonstrations and in daily operations will be calibrated according to the procedures traceable to the National Bureau of Standards, initially and at least annually thereafter. A copy of the calibration certificate will be submitted to the Agency on January 15 of each year. In addition, recording devices will be time synchronized at least quarterly.
  - k. In addition to the mechanical integrity demonstration required by this permit, the Agency may require the Permittee to conduct a demonstration of the mechanical integrity of the well when evidence reasonably indicates that the integrity of the well is in question.
27. Contingency Plan. The Permittee will follow the contingency plan outlined in Attachment F. (35 I.A.C. 702.160)
28. EP Toxicity. The permittee will perform an extraction procedure (EP) toxicity in accordance with 35 I.A.C. 721.124 for arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver on a composite waste stream. The laboratory results of the EP toxicity will be submitted within 30 days after the effective



date of this modified permit monthly report to the Compliance Section, Division of Land Pollution Control and annually thereafter.

29. Neutralization. The Permittee will operate and maintain a system for neutralization of the plant process wastewater.
30. The Agency has approved the information received to meet Section 39(h) of the Environmental Protection Act on the condition that the permittee continue to research the arsenic contamination. The permittee will submit to the Permit Section, Division of Land Pollution Control by November 1, 1989 a detailed report dealing with the source of arsenic, means of treatability, ways to eliminate arsenic from source material, and other ways to manage the waste to eliminate the arsenic contamination. The permittee should demonstrate the technical feasibility and economical reasonableness of recycling the arsenic for reuse or treatment.
31. Continuing Releases at Permitted Facilities. Issuance of this Underground Injection Control (UIC) permit does not release the permittee from complying with applicable requirements of the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act of 1976, as amended (42 USC., §6901 et seq., commonly known as RCRA), and the 1984 Hazardous and Solid Waste Amendments (HSWA). In particular, Section 3004(u) of HSWA requires owner/operators of hazardous waste treatment, storage and disposal facilities seeking permits to take corrective action for all releases of hazardous waste or hazardous waste constituents from any solid waste management unit (SWMU), which includes the injection well. If at any time, the USEPA should determine that a release of hazardous waste or hazardous waste constituents is taking, or has taken place from the well or the injection zone, corrective action requirements and a schedule for their completion may be imposed by USEPA under Section 3004(u) and 3008(h) HSWA. This permit does not constitute a RCRA permit-by-rule, and, further, does not release the permittee from complying with the corrective action requirements for other SWMUs at the same facility, nor any other RCRA and HSWA regulations applicable to units and operations at this facility.
32. Restrictions on Future Land Use for Hazardous Facilities. (35 I.A.C. 724.219 & 220) Within 90 days after final plugging and abandonment, the owner or operator must submit to the Compliance Section, Division of Land Pollution Control, to the County Recorder, and to any local zoning authority a survey plat indicating the location of the disposal well with respect to permanently surveyed bench-marks. The plat must be prepared and certified by a professional land surveyor. In addition, the



owner or operator must submit to the Agency, the County Recorder and any local zoning authority a record of the type, location and quantity of hazardous waste placed in the well. For wastes disposed before these regulations were promulgated, the owner or operator must identify the type and quantity of the wastes to the best of their knowledge and in accordance with any record which has been kept. Any changes in the type, location or quantity of hazardous wastes disposed of within the facility which occurred after the survey plat and record of wastes had been filed must be reported to the agencies where original plat and record were filed.

The owner of the property where a disposal well is located must record, in accordance with Illinois law, a notation on the deed to the facility property, or on some other instrument normally examined during a title search, to notify, in perpetuity, a potential purchaser of the property of the following:

- (1) the land has been used to dispose hazardous waste;
- (2) the steel plate and cement plug in the well must never be disturbed or removed;
- (3) the survey plat and record of the type well location, and quantity of hazardous waste has been filed with the Illinois Environmental Protection Agency, the County Recorder, and any local zoning authority.



## Attachment A

## PROCEDURES FOR PLUGGING AND ABANDONMENT OF WASTE DISPOSAL #1

1. Displace the tubing and wellbore with sufficient fresh water to flush all waste out of the tubular goods and near wellbore area. Remove all flow lines, associated equipment and instrumentation from wellhead and immediate area.
2. Move in well service rig, including temporary storage tanks, pump and pipe racks.
3. Kill well with adequately weighted water to place fluid level below the well head and prevent the backflow of waste.
4. Remove wellhead. Fill mud tanks with fresh water.
5. Pull out of hole laying down 2 7/8" and 2 3/8" fiberglass injection tubing. Fibercast tubing does not have sufficient strength to use during plugging and abandonment procedures therefore a steel workstring will be required.
6. Rig up wireline service unit and run appropriate logs (including electrical logs) and tests to determine casing condition and determine if channeling has developed behind the 7"/5 1/2" and 7"/4 1/2" protection casing. Also, if it is technically feasible, determine if the cement plug from 4025 feet to 4154 feet is leaking. Rig down wireline service unit. Correct any problems as required.
7. Make up 4 3/4" drill bit and casing scraper on workstring and trip in hole to top of 4 1/2" Fibercast casing (about 3553'). This step will gauge and prepare the 5 1/2" casing for running a cement retainer. Pull out of hole, lay down bit and scraper.
8. Rig up cementing equipment. Make up 5 1/2" cement retainer assembly and run in hole to top of 4 1/2" Fibercast casing. Set retainer at 3550+. Mix and pump sufficient 50/50 Pozmix cement to fill the open hole section from about 4000' to 3623' (about 103 sacks). The purpose of this cement is to form a base on which to emplace a volume of corrosion resistant cement.
9. Tag bottom of well to ensure that a base has been established.
10. Follow the pozmix cement with epoxy resin cement. Using necessary spacer fluids, displace enough resin cement to form a 80' plug beneath the retainer, then close the retainer valve. Fresh water may be used as displacement fluid.
11. Disengage tubing from retainer and emplace a 50' epoxy cement plug on top of the cement retainer (about 167 gallons of epoxy cement will be required). Pull tubing to about 3320 feet and reverse the hole clean.





DRAFT PERMIT

UIC-003-W1-AC

Allow cement to set overnight before tagging top of plug to confirm proper set-up. Pressure test plug to 1000 psig.

12. Mix and pump an accelerated Class "A" cement plug from the top of the epoxy cement plug to about 1870 feet (about 161 sacks). Pull workstring to about 1690 feet and reverse the workstring clean. Wait on cement (about 4 hours) and confirm location by tagging.
13. Rig up perforating unit and perforate through 5 1/2" and 7" casing into 7" x 9 5/8" annulus at about 1865'.
14. Displace oil in 7" x 9 5/8" annulus by circulating with water or chemical flush then displace with Class "A" cement from about 1865' to the surface.
15. Fill the 5 1/2" casing with cement to the surface (about 450 sacks).
16. Remove bradenhead, cut casings off at 3' below grade and weld 1/2" plate with 1 inch bleed valve across 13 3/8" surface pipe. Inscribe on plate, in a permanent manner, the following information: (1) operator name, (2) closure date and (3) UIC permit number.
17. Release all equipment and clean up location.
18. Submit closure data to regulatory agency.
19. File a plugging affidavit, in duplicate, on Mining Board form with the Oil and Gas Division of Illinois Department of Mines and Minerals. A copy of this affidavit shall be filed with the Compliance Section, Division of Land Pollution Control within 30 days following plugging and abandonment.



## Attachment B

## PROCEDURES USED FOR MECHANICAL INTEGRITY

Pressure Test

1. Time permitting, add maximum amount of fresh water to injection stream at least 12 hours prior to well shutdown.
2. Shut off all sources of process waste water and inject a minimum of 1100 gallons of "city" water into well.
3. Shut down deep well and depressurize inner annulus by backflowing annulus kerosene into the surface kerosene tank.
4. Remove well head shed, dismantle surface waste water transfer line.
5. Move in well service rig and pull out injection tubing.
6. Insert a casing plug near the bottom of the 5 1/2" casing.
7. Fill annulus with water and allow to stabilize.
8. Pressurize the casing with water to 500 psig, wait four (4) hours to allow for temperature stabilization, repressurize to 500 psig if necessary, and maintain pressure for 1 hour to determine the integrity of casing.
9. Pressurize the 9 5/8 inch and 7 inch annulus space to 100 psig and maintain pressure for 1 hour to determine the integrity of the annular space.
10. Corrective action will be taken if the pressure change is more than 3 percent for any 30 minute period following the stabilization time.
11. Remove casing plug.
12. If needed, address any well deficiencies as required.
13. Install injection tubing (previously surface pressure tested to 300 psig).
14. Install surface transfer line and well shed, repressurize inner annulus to normal operating pressure (215-255 psig).
15. Partially backflush annulus kerosene to assure proper operation of electrode monitoring system.
16. Repressurize annulus to normal operating pressure and start up well.
17. Verify proper operation of well by visually inspecting surface lines and monitoring the annular fluid conductivity, injection and annulus pressures, electrode wire continuity and injection flow rate.



DRAFT PERMIT

UIC-003-W1-AC

18. Plot the data gathered (volume versus annulus pressure) and determine volume of fluid loss for pressure loss.
19. The data obtained, including recording charts from the testing, shall be submitted to the Compliance Monitoring Section, Division of Land Pollution Control. The test data must be submitted with the second monthly report submitted to the Agency following the test. A technical evaluation shall accompany all test results.

#### Quarterly Conductivity Test

1. Stop injecting waste acid for at least 12 hours prior to backflowing annulus kerosene.
2. Depressurize inner annulus by backflowing annulus kerosene into the surface kerosene tank allowing the waste/kerosene interface to move up the annular space.
3. As the interface contacts the electrodes, an increased conductivity of annular fluid should be detected by the monitoring system.
4. The detection of higher conductivity should alert the well operator by:
  - a. direct readout of the conductivity meters
  - b. visual alarm
  - c. audio alarm
  - d. printout of the "alarmed" conductivity on the monitoring system
5. After the above alarm systems have been activated the inner annulus shall be repressurized to the normal operational pressure.
6. Failure to detect higher conductivity constitutes a well failure and appropriate action will be taken.

#### Temperature Log

1. Shut off all sources of process waste water and inject a minimum of 1100 gallons of "city " water into the well.
2. Shut down well and depressurize inner annulus by backflowing annulus kerosene into surface kerosene tank.
3. Remove well shed and dismantle surface waste water transfer line.
4. Move in well service rig and pull out injection tubing while adding a small amount of water into the casing to displace the volume of injection tubing removed.
5. Wait 48 hours after completing step 1 (above) to initiate temperature log.



DRAFT PERMIT

UIC-003-W1-AC

6. Run baseline temperature survey from the surface down, for the entire length of the well.

Note: All temperature surveys will be run into the well.

7. Install injection tubing.
8. Repressurize inner annulus to normal operating pressure (215-255 psig).
9. Install surface transfer line and well shed.
10. Partially backflush annulus kerosene to assure proper operation of electrode monitoring system.
11. Repressurize annulus to normal operating pressure and start up the well.
12. Verify proper operation of the well by visually inspecting surface lines and monitoring the annulus fluid conductivity, injection and annulus pressures, electrode wire continuity and injection flow rate.
13. The data<sup>a</sup> obtained, including recording charts from the testing, shall be submitted to the Compliance Section, Division of Land Pollution Control. The test data must be submitted with the second monthly report following the test. A technical evaluation shall accompany all test results.

Radioactive Tracer Survey

1. Shut off all sources of process waste water and inject a minimum of 1100 gallons of "city" water into the well.
2. Remove well shed and dismantle surface waste water transfer line.
3. Set up relatively constant injection to 10 to 20 gpm city water.
4. Move in and set up RAT rig and tool.
5. Reposition the tool and eject a small amount of iodine or equivalent into the well and track the tracer in the tubing to verify the absences of tubing leaks.
6. Position the tool at the bottom of the injection tubing and eject another slug of iodine tracer or equivalent into the well.
7. Reposition the tool at the top of the injection zone and wait a period of time that it would take to show the absence of vertical migration.
8. Remove tool, install surface transfer line, and well shed.
9. Verify proper operation of the well by visually inspecting surface lines and monitoring the annulus fluid conductivity, injection and annulus pressures, electrode wire continuity and injection flow rate.



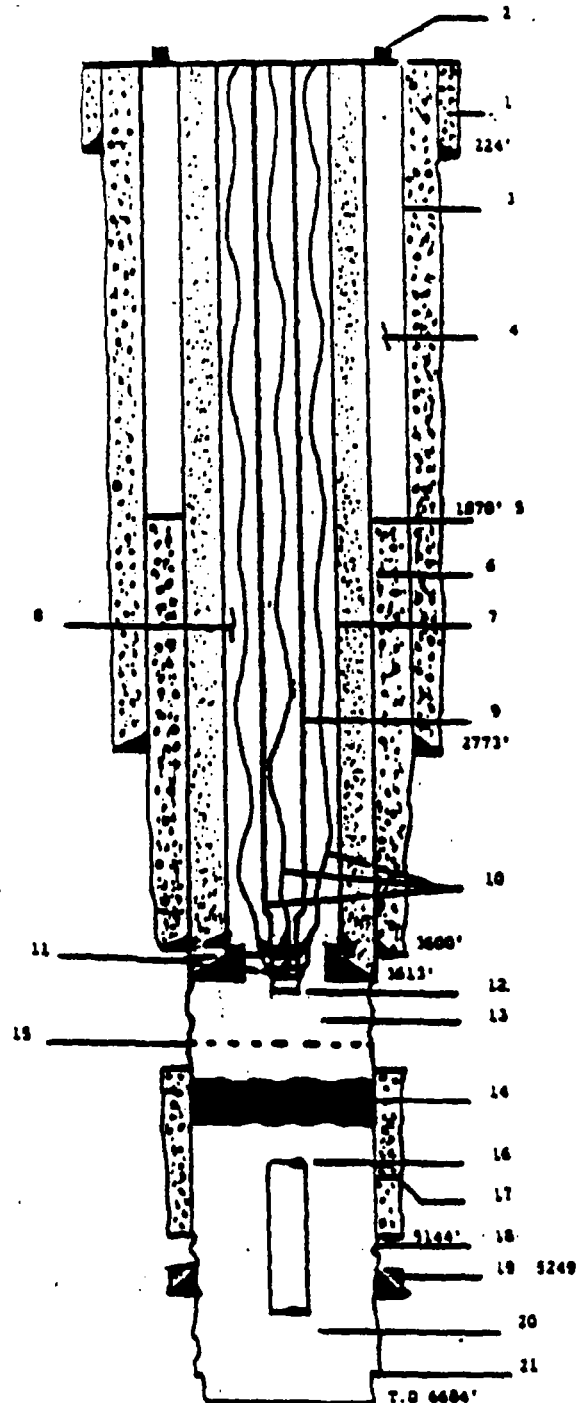
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UIC-003-W1-AC

10. The data obtained, including recording charts from the testing, shall be submitted to the Compliance Section, Division of Land Pollution Control. The test data must be submitted with the second monthly report following the test. A technical evaluation shall accompany all test results.



Attachment C  
WELL DIAGRAM



NOTE: All measurements from K.B. 14' above G.L.

1. Surface Casing: 13 1/8", 48 lb/ft. K-55 casing, set in 17 1/2" hole to 224' (K.B.). Cemented to surface with 450 lb Pozmix with 18 salt and 44 gal.
2. 1" collar to monitoring vessel.
3. Intermediate Casing: 9 5/8", 36 lb/ft. K-55 casing set in 12 1/4" hole to 1870' (K.B.). Cemented to surface with 450 lb Pozmix with 18 salt and 44 gal.
4. Oil between 9 5/8" and 7" casing to monitoring vessel.
5. Cement top between 9 5/8" and 7" casing at 1870'.
6. Original protection casing is cased string as follows: 4970' of 7" 16 lb/ft. K-55 casing and 174' of 7" Fibercast casing between 4970' and 5144' set in 8 1/4" hole. Cemented to 1870' in 2 stages:  
1st stage, with 350 ex. Pozmix with 18 salt and 44 gal. Plus 100 gal. cement.  
2nd stage, with 510 ex. Pozmix with 18 salt and 44 gal.
- During the December, 1973 workover, the 7" casing was milled out from 1870' to 3694'. This included the original DV tool set at 3640'.
7. Inner protection Casing: cased string follows: 3551' of 3 1/2", 17 lb/ft. K-55, Hydril Flushjoint casing, Plus 4 1/2" OD 3.7 lb/ft. 1300 psi. EUE TAC, Fibercast casing, set in 8 1/4" hole to 3613'. Cemented with 2000 gal. Special cement and circulated to the surface.
8. Tubing-casing annulus filled with Kerosene to 3613'.
9. Injection Tubing, 3545' of 2 7/8" OD 2.1 lb/ft. EUE SRD fiberglass plus 10' of 2 3/8" OD, 1.4 lb/ft. EUE SRD fiberglass to 3670'.
10. (3) 4 - Conductor Cables
11. Load anodes to monitor Kerosene/water interface are located at 3559', 3562, 3572', and 3573'.
12. Tailpipe 127' of 2 3/8" OD, 1.4 lb/ft. EUE SRD fiberglass set without a pack to 3670'.
13. Disposal Interval, Eminence and Potosi dolomites completed open hole from 3613' to 4000' (K.B.).
14. Cement Plug 35 sacks latex cement to 4025' to 4154'.
15. T.D. found with bailer, 1710'.
16. Top of broken off 3 1/2" Fibercast 4855'.
17. 7" Fibercast Casing from 4970' to 5144' cemented with 100 gal. resin cement (See No. 6 above).
18. 107' 8 1/4" open hole.
19. 68' of 7" Fibercast Casing broken casing above 5183' - 5249'.
20. 8 1/4" open hole from 5144' - 6150'.
21. 7 7/8" open hole from 6150' to 6684'.

ALLIED SIGNAL CORPORATION  
DANVILLE WORKS  
DANVILLE, ILLINOIS

FIGURE 1  
SCHEMATIC OF CONSTRUCTION OF  
WELL NO. 1

DWG. 450-1 46

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UIC-003-W1-AC

Attachment D

CHEMICAL PARAMETERS FOR MONITORING PROGRAM

<u>Parameter</u>	<u>Analytical Frequency*</u>
Total Acidity	W**
Chloride (mg/l)	W
Fluoride (mg/l)	W
Sodium (mg/l)	W
Free Chlorine (mg/l)	W
Specific Gravity	W
Nickel (mg/l)	W
Arsenic (mg/l)	W
Suspended Solids (mg/l)	W
Viscosity (Centipoise)	M
Phenolics, total recoverable (ug/l)	M
Total Organic Carbons (TOC)	W
Total Organic Halogen (TOX)	M
Organic scan (ppb) (unfiltered)	Q
pH (Units)	C
Temperature (°F)	C
Total Dissolved Solids (mg/l)	W

\*M = Monthly

W = Weekly

Q = Quarterly

C = Continuous

\*\* Monitoring of total acidity may be waived by the Agency as a minor modification upon demonstration by the Permittee that the neutralization system is operating in a stabilized and satisfactory manner.





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UIC-003-WI-AC

Attachment E

## PROCEDURES FOR CALCULATING AVERAGE VALUES

$$\text{Daily Average Flow Rate} = \frac{\text{gallons of wastewater injected (gal/day)}}{\text{(gal/min)} \quad \text{total injection time (hrs/day) x (60 min./hr)}}$$

$$\text{Monthly Average Flow Rate} = \frac{\text{gallons of wastewater injected (gal/month)}}{\text{total injection time (hrs/month) x (60 min./hr)}}$$

$$\text{Daily Average Pressure} = \frac{\text{sum of pressures recorded/day (psig)}}{\text{\# of readings taken/day}}$$

$$\text{Monthly Average Pressure} = \frac{\text{sum of pressures recorded/month (psig)}}{\text{\# of readings taken/month}}$$

All readings to be taken every two (2) hours, except when the annulus is depressurized for mechanical integrity demonstration.



DRAFT PERMIT

UIC-003-W1-AC

Attachment F

## CONTINGENCY PLAN FOR WELL OR EQUIPMENT FAILURE

The injection well has the following alarms which are designed to alert the operator of potential well failures:

Annular Fluid Hi Conductivity. This alarm is activated when the conductivity of the annular fluid in the area surrounding the electrode rings increases beyond the alarm setting of 0.6 micromhos/centimeter.

Electrode Wire Continuity Break. This alarm signals the operator when a failure exists in the electrode wiring.

Well Head Rupture Disk Alarm. This alarm signals the operator when the 90# rupture disk, which is located on the transfer/injection line immediately above the well head, has ruptured.

In addition to the above alarms the following monitoring devices are used to monitor for proper well operation:

Annulus Pressure Gauge  
Injection Flow Rate Meter  
Temperature Gauge  
Annulus Pressure Recorder  
Flow Rate Recorder  
Conductivity/Continuity Recorder  
Flow Totalizer  
pH recording device

Any circumstances that reasonably indicate a potential for well failure require immediate action of the operator including

- 1) Shut off flow to the well.
- 2) Flush tubing with fresh water and inject annulus oil into the annulus to displace the corrosive waste that has entered the tubing or casing.
- 3) Identify and repair the exact failure.

Any indication of a possible well failure requires immediate notification of a plant supervisor. In the event of a surface failure such as a transfer line leak, the well will be shut down and repaired prior to any well start-up.

In addition to actual mechanical well failures, the well will be shut down if it cannot be operated within the limits specified in the permit, (those being 100 psig injection pressure, 125 gpm injection rate, and 235+20 psig annulus pressure) unless prior approval is obtained from the Agency.

In the event of a prolonged well failure, the plant will have to be shutdown with the exception of operating a boiler for heating purposes during cold



weather. In this worst case scenario the plant would generate approximately 400 gallons per day of waste water from boiler operation, 25 gallons per day of waste water for scrubber operations and an average of 3800 gallons per day of collected rainfall. Given an "on-hand" storage capacity of approximately 460,000 gallons, this plant could operate in this mode for 109 days. If for any reason the deep well would not be expected to be made operational during this period, the boiler would be shut down, acid storage would be emptied (negating the need for scrubbers) and rainwater diverted such that it would not collect in the process sewers. These actions would totally eliminate all sources of the deep well effluent.

Any intentions of storing hazardous waste water in tanks for greater than 90 days will require the tanks to go through closure according to 35 I.A.C. 722.134. A closure plan will have to be submitted on the storage tanks, according to 35 I.A.C. 722.134.



DRAFT PERMIT

UIC-003-W1-AC

Attachment G

## SUMMARY OF SUBMITTAL DATES

The following is a summary of submittal dates for data required by this permit. The referenced condition must be consulted for complete details.

<u>Condition</u>	<u>Submittal</u>	<u>Date Due</u>
A 4	Changes in Tubing Specifications	30 days prior to installation
B 3	Waste Analysis Plan	30 days after the effective date of this modified permit
B 4	Groundwater Monitoring Plan	30 days after the effective date of this modified permit or a later date established pursuant to an extension
B 5	Monthly Operation Reports	28th day of each month
H 2	Duty to reapply	180 days prior to expiration
H 12(a)	Planned changes	15 days prior to planned changes
H 13	Corrective Action Requirements by telephone	24 hours after the discovery
	by letter	5 days after the discovery
H 14	Endangerment of Environment	within 24 hours of the time of endangerment
H 17(b)	Plugging and Abandonment Cost Estimates for Inflation	30 days after each anniversary
H 18(a)	Bankruptcy	10 days after commencement of the proceeding
H 18 (b)	Alternative Financial Responsibility	60 days after such event



DRAFT PERMIT

UIC-003-W1-AC

<u>Condition</u>	<u>Submittal</u>	<u>Date Due</u>
H 21(b)	Correction of False or Omitted Information	10 days after the discovery
H 22	Restriction on Unpermitted Waste	Jan. 15th of each year
H 23(b)	Certification of Plugging and Abandonment	30 days after plugging
H 24	Plans for Conversion or Abandonment	180 days prior to actual conversion or abandonment
H 24	Notify before Conversion or Abandonment	45 days prior to conversion or abandonment
H 26(e)	Additional Mechanical Integrity Testing	30 days prior to demonstration
H 26(g)	Intent to demonstrate mechanical integrity	30 days prior to demonstration
H 26(i)	Gauge calibration	Jan. 15 of each year
H 28	EP Toxicity	30 days after the effective date of this modified permit and annually thereafter
H 30	Section 39(h) detailed report	November 1, 1989
H 32	Survey plat indicating location of disposal well	90 days after plugging and abandonment
Attachment H	Annual Monitoring Summary	March 1 of each year



## DRAFT PERMIT

UIC-003-W1-AC

## Attachment H

## GROUNDWATER MONITORING PLAN

The permittee will submit a plan for monitoring the groundwater quality and formation fluid pressure of the first permeable zone immediately overlying the confining layer above the injection zone in accordance with 35 I.A.C. 730.113(B)(4). This plan must be submitted to the Permit Section, Division of Land Pollution Control for approval no later than forty-five (45) days after the effective date of this modified permit. A schedule for implementation must be included with the plan.

The plan must include:

- A. A comprehensive report describing the local hydrogeologic framework in which the injection well operates. The report should include:
  1. An interpretation of formation-specific geologic information relating to: a) the adequacy of the confining layer or system; b) the locations and physical characteristics of overlying permeable zones including all underground sources of drinking water (USDWs); and c) an evaluation of faulting, fracturing and jointing. Specific information should be based on historical and current operating records, research of available geologic literature and/or logs from nearby wells. An evaluation should be made of the reliability of the above information and any data gaps identified. Where adequate information does not exist, it must be supplied by actual measurements;
  2. A detailed report on the existence of unplugged, abandoned holes which penetrate the confining layer above the injection zone within a minimum of a 5 mile wide area of review. The report should assess the level of reliability and completeness of existing data on abandoned wells. Where historical records are insufficient, magnetometer surveys or field reconnaissance may be necessary;
  3. Identification of the proposed monitoring zone and a complete description of methods which will be used to determine aquifer parameters such as permeability, transmissivity and storage coefficient;
  4. An evaluation of the vulnerability to contamination of the lowest USDW; and,
  5. A computation of the zone of endangering influence as per 35 I.A.C. 730.106 and a calculation of anticipated pressure build-up in the injection zone over the life of the facility. Data used in these calculations should be supplied by actual measurements.



## DRAFT PERMIT

UIC-003-W1-AC

- B. A monitoring well design and operating plan based on the information in the comprehensive report in A of this attachment. The monitoring well design plan shall include:
1. The number and location of wells designed to: a) detect any leakage of injected fluids above the confining zone; and b) monitor pressure changes by continuous water level recording. A minimum of three (3) wells is recommended to define hydraulic gradient. Monitoring wells should be located as close as physically possible to the injection well.
  2. Well specifications, including:
    - a) drilling and development methods;
    - b) construction details;
    - c) quality assurance plan;
    - d) safety plan;
    - e) proposed mechanical integrity determination;
    - f) step drawdown test to determine well efficiency; and
    - g) television survey (optional).
  3. A sampling plan, including:
    - a) proposed data to be collected during drilling;
    - b) proposed monitoring parameters, including background formation fluid parameters, waste indicator "fingerprint" parameters, and pressure;
    - c) sample collection procedures;
    - d) preservation and shipment;
    - e) analytical procedures; and
    - f) chain of custody control;
  4. Reporting proposal, including:
    - a) initial background survey of formation pressure and water chemistry for the monitoring zone;
    - b) monthly and quarterly submittal of required data; and



- c) annual interpretive summary report

Waiver Demonstration

An exemption from groundwater monitoring requirements may be granted if the applicant can conclusively demonstrate that there is no potential for fluid movement above the confining zone caused by the injection activity, or the USDWs are completely absent within the area of review. Examples of acceptable exemption criteria include:

- . The demonstrated absence of complex geologic structures such as faults; and
- . Accurate and detailed records confirm that no unplugged and abandoned or improperly plugged wells exist within the area of review; and
- . A sufficiently thick confining formation (e.g. 500 feet of clay or shale); and
- . The potentiometric surface of the injection zone will not exceed that of the lowest USDW at any time during the operating life of the facility.

Where the above criteria cannot be adequately demonstrated using existing data, direct measurement of vertical permeability of the confining system may be required.

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